

# Comprehensive Conservation Plan

*Bamforth National Wildlife Refuge  
Hutton Lake National Wildlife Refuge  
Mortenson Lake National Wildlife Refuge*

**September 2007**

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# Comprehensive Conservation Plan

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Hutton Lake National Wildlife Refuge  
Mortenson Lake National Wildlife Refuge*

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# Abbreviations

Administration Act	National Wildlife Refuge System Administration Act of 1966
ABC	American Bird Conservancy
BBS	breeding bird survey
BCR	Bird Conservation Regions
CCC	Civilian Conservation Corps
CCP	comprehensive conservation plan
CFR	Code of Federal Regulations
cfs	cubic feet per second
CRP	conservation reserve program
CWCS	comprehensive wildlife conservation strategy
DNC	dense nesting cover
DU	Ducks Unlimited
EA	environmental assessment
EO	executive order
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
FMP	fire management plan
FONSI	finding of no significant impact
FTE	full-time equivalent
GIS	geographic information system
GPS	global positioning system
GS	general schedule (employment)
HAPET	Habitat and Population Evaluation Team
HMP	habitat management plan
IMPROVE	interagency monitoring of protected visual environments
Improvement Act	National Wildlife Refuge System Improvement Act of 1997
LWCF	Land and Water Conservation Fund
LPP	land protection plan
NABCI	North American Bird Conservation Initiative
NAWCA	North American Wetlands Conservation Act
NAWMP	North American Waterfowl Management Plan
NEPA	National Environmental Policy Act
NGO	nongovernmental organization
NOI	notice of intent

NRCS	Natural Resources Conservation Service
NWI	national wetland inventory
NWR	national wildlife refuge
NWRS	National Wildlife Refuge System
PFW	Partners for Fish and Wildlife
PL	public law
PPJV	Prairie Pothole Joint Venture
PPR	prairie pothole region
Refuge System	National Wildlife Refuge System
region 6	Mountain–Prairie Region of the U.S. Fish and Wildlife Service
RONs	Refuge Operating Needs System
SAMMS	Service Asset Maintenance Management System
Service	U.S. Fish and Wildlife Service
SUP	special use permit
SWG	state wildlife grant
TMDL	total maximum daily load
TNC	The Nature Conservancy
UGHEP	upland gamebird habitat enhancement program
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WG	wage grade (employment)
WHIP	wildlife habitat incentive program
WPA	waterfowl production area
WMD	wetland management district
WUI	wildland–urban interface



# Summary

The U.S. Fish and Wildlife Service (Service) has developed this comprehensive conservation plan as the foundation for management and use of the three Laramie Plains refuges (Bamforth, Hutton Lake, and Mortenson Lake) located in Albany County, Wyoming. This plan, approved in 2007, will guide management of the refuges for the next 15 years.

The National Wildlife Refuge System Improvement Act of 1997 (Improvement Act) requires the Service to develop a comprehensive conservation plan by 2012 for each national wildlife refuge in the National Wildlife Refuge System (Refuge System).

This brief summary describes the refuges, comprehensive conservation plan, and planning process.

## THE LARAMIE PLAINS REFUGES

Laramie, Wyoming, is positioned in a high plains basin ecosystem known as the Laramie Basin. The shallow depressions of the basin, within the relatively flat topography of the region, support wetland complexes that are unique to the area. These wetland complexes provide resting, nesting, and breeding areas for migratory birds in the semiarid environment.

The Laramie Basin is home to three national wildlife refuges known collectively as the “Laramie Plains refuges.” Located within 15 miles of Laramie, the three refuges are managed by Service staff headquartered at the Arapaho National Wildlife Refuge (NWR) near Walden, Colorado, which lies approximately 65 miles southwest of Laramie.

In the early 1930s, J. Clark Salyer III was charged with identifying areas to protect as national wildlife refuges for migratory birds. He surveyed the area around Laramie and selected two locations as national wildlife refuges for migratory birds. Bamforth NWR and Hutton Lake NWR were established by executive orders in 1932, within one day of each other.

Bamforth NWR comprises three separate parcels with private or state lands between them. The 1,166-acre refuge contains Bamforth Lake, but most of the lake falls outside the refuge boundary. No public use is allowed on Bamforth NWR.

Hutton Lake NWR consists of 1,928 acres and supports approximately 2,000 visits over the course of a year, mostly from March through October. Wildlife-viewing opportunities and refuge access are limited from November through February due to frozen ponds and cold, snowy weather.

Mortenson Lake NWR was established in 1993 to protect the Wyoming toad’s last known population. The Wyoming toad was listed as an endangered species in 1984. Physical features of 1,968-acre refuge include Mortenson Lake, Soda Lake, and Gibbs Pond. Habitat types include open water, wetlands, wet meadow, grassland, sagebrush, and greasewood communities. No public use is currently allowed on the refuge to prevent potential adverse impact on the Wyoming toad.



*Refuge habitats include wet meadows and grasslands.*

USFWS

## THE PLANNING PROCESS

Through the environmental analysis process, the Service has selected as the preferred alternative (final comprehensive conservation plan) for the Laramie Plains refuges alternative B from the draft conservation plan and environmental assessment published in August 2007.

In 2006, a planning team of refuge and other Service staff gathered and began to analyze resource information. The planning process included designing a vision for the three refuges, along with goals to reach the vision. After identifying key issues related to achieving the vision, the team developed management alternatives.

The team invited the public to participate in the planning process and public scoping. A mailing list of about 165 names was created and included private citizens; local, regional, and state government representatives and legislators; other federal agencies; tribal governments; and nonprofit organizations.

Key issues (habitat, wildlife, water quality, public outreach, public use, and refuge operations) were identified during analysis of concerns raised by

refuge staff, along with analysis of public comments collected during scoping. These issues were addressed throughout the planning process and in the final comprehensive conservation plan.

## COMPREHENSIVE CONSERVATION PLAN

This plan includes detailed objectives and strategies to carry out the vision and goals for the Laramie Plains refuges.

The below vision describes what the refuges will be and what the Service hopes to do, and is based primarily on the mission of the National Wildlife Refuge System and specific purposes of the refuges.

### Vision

The wetland complexes and uplands of the Laramie Plains refuges are important resource components of this semiarid region that provide key habitat for the Wyoming toad, migratory birds, and resident wildlife.

The refuges will be evaluated to direct management decisions to provide natural and enhanced habitat,



*Bulrushes.*

thereby maximizing the unique potential of each refuge. Wildlife-dependent recreation opportunities will be evaluated for each refuge to determine potential, appropriate public use opportunities.

## Goals

The following goals will direct work toward achieving the vision for the Laramie Plains refuges.

### Research and Science Goal

Conduct natural resource management using sound science and applied research to advance the understanding of refuge resources and natural resource function.

*(Applies to all three Laramie Plains refuges.)*

### Partnerships Goal

Work with partners to determine the wildlife and habitat resources on the refuges, to maximize wildlife habitat protection, and to increase understanding of wildlife needs, as well as the benefits wildlife offer to individuals and communities, on and off the refuges.

*(Applies to all three Laramie Plains refuges.)*

### Cultural Resources Goal

Identify and evaluate the cultural resources on the refuges and protect those that are determined to be significant.

*(Applies to all three Laramie Plains refuges.)*

### Refuge Operations Goal

Secure and demonstrate the effective use of funding, staffing, and partnerships for the benefit of all resources in support of the refuges and the Refuge System.

*(Applies to all three Laramie Plains refuges.)*

### Natural Resources Goal

Conduct baseline surveys to identify refuge resources and the role these resources serve in the Laramie Basin ecosystem and the Refuge System.

*(Applies only to Bamforth NWR.)*

### Wetlands Goal

Manage refuge impoundments and other wetlands to create diverse habitat for wetland-dependent wildlife.

*(Applies only to Hutton Lake NWR and Mortenson Lake NWR.)*

### Uplands Goal

Evaluate and manage shrub- and grass-dominated uplands for benefits to migratory birds (willet, horned lark), white-tailed prairie dogs, pronghorn, and other wildlife.

*(Applies only to Hutton Lake NWR and Mortenson Lake NWR.)*

### Visitor Services Goal

Provide wildlife-dependent recreational opportunities to a diverse audience when the administration of these programs does not adversely affect habitat management objectives.

*(Applies only to Hutton Lake NWR.)*

### Wyoming Toad Goal

In conjunction with the Wyoming Toad Recovery Team, manage refuge lands around Mortenson Lake and other areas on the refuge as necessary to protect, create, and manage habitat suitable for Wyoming toad recovery from endangered status.

*(Applies only to Mortenson Lake NWR.)*





# 1 Introduction

The U.S. Fish and Wildlife Service (Service) has developed this comprehensive conservation plan (CCP) to provide a foundation for the management and use of the three national wildlife refuges located in southeast Wyoming near the town of Laramie (figure 1).

The CCP is intended to be a working guide for management programs and actions over the next 15 years for the three refuges known collectively as the “Laramie Plains refuges”: Bamforth National Wildlife Refuge (NWR), Hutton Lake NWR, and Mortenson Lake NWR.

The Service developed this CCP in compliance with the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act) and Part 602 (National Wildlife Refuge System Planning) of “The Fish and Wildlife Service Manual.” The actions described in this CCP also meet the requirements of the National Environmental Policy Act of 1969 (NEPA). Compliance with the NEPA is being achieved through involvement of the public and inclusion of an integrated environmental assessment (EA) in the previous draft document (see environmental compliance documents in appendix A).



*Yellow-headed blackbird.*

USFWS

The CCP specifies the necessary actions to achieve the vision and purposes of refuges. Wildlife is the first priority in refuge management; public use (wildlife-dependent recreation) is allowed and encouraged, as long as it is compatible with the refuges’ purposes.

A planning team of representatives from various Service programs, refuge staff, the Wyoming Toad Recovery Team, and the Wyoming Game and Fish Department prepared the CCP. In developing this plan, the team used input from local citizens and organizations.

The evaluation of management alternatives for the refuges was documented in the “Draft Comprehensive Conservation Plan and Environmental Assessment—Bamforth National Wildlife Refuge, Hutton Lake National Wildlife Refuge, Mortenson Lake National Wildlife Refuge.” In September 2007, the regional director of region 6 of the Service selected alternative B as the preferred alternative for the CCP for the Laramie Plains refuges.

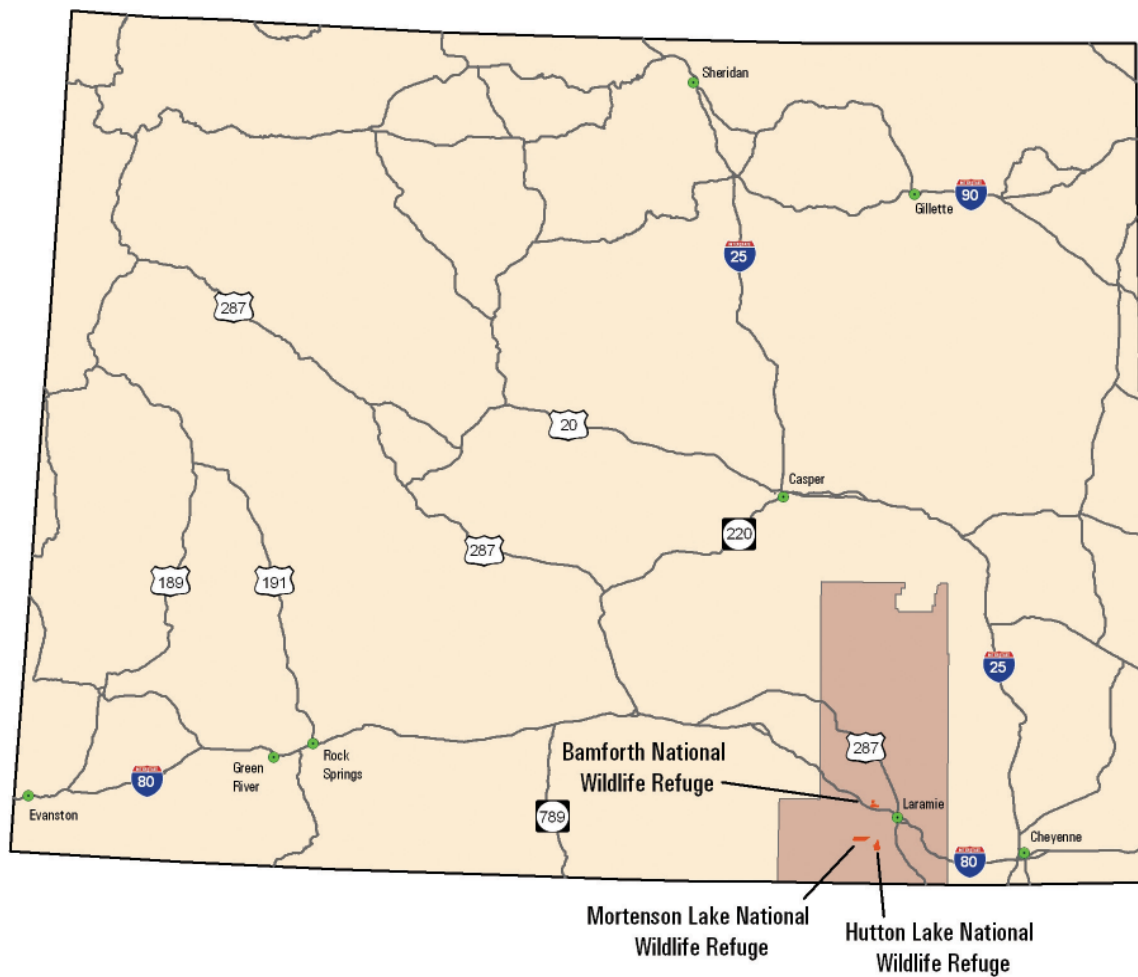
The planning process and public involvement are further described in “The Planning Process” section of this chapter.

## PURPOSE AND NEED FOR THE PLAN

The purpose of this CCP is to identify the role that the refuges will play in support of the mission of the National Wildlife Refuge System (Refuge System), and to provide long-term guidance for management of refuge programs and activities. The CCP is needed

- to communicate with the public and other partners in efforts to carry out the mission of the Refuge System;
- to provide a clear statement of direction for management of the refuges;
- to provide neighbors, visitors, and government officials with an understanding of the Service’s management actions on and around the refuges;
- to ensure that the Service’s management actions are consistent with the mandates of the Improvement Act;

U.S. Fish & Wildlife Service



Bamforth National Wildlife Refuge  
Mortenson Lake National Wildlife Refuge  
Hutton Lake National Wildlife Refuge

#### LEGEND

 National Wildlife Refuge (NWR)

 Albany County

0 50 100 150 200 Kilometers

0 25 50 75 100 Miles



#### Region 6 Mountain - Prairie Region

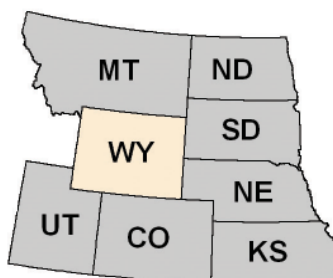


Figure 1. Vicinity map for the Laramie Plains refuges, Wyoming.

- to ensure that management of the refuges is consistent with federal, state, and county plans;
- to provide a basis for development of budget requests for the refuges' operation, maintenance, and capital improvement needs.

## THE U.S. FISH AND WILDLIFE SERVICE AND THE NATIONAL WILDLIFE REFUGE SYSTEM

The Service is the principal federal agency responsible for fish, wildlife, and plant conservation. The Refuge System is one of the Service's major programs.

### The U.S. Fish and Wildlife Service

*The mission of the U.S. Fish and Wildlife Service, working with others, is to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people.*

Over a century ago, America's fish and wildlife resources were declining at an alarming rate. Concerned citizens, scientists, and hunting and angling groups joined together to restore and sustain America's national wildlife heritage. This was the genesis of the U.S. Fish and Wildlife Service.

Today, the Service enforces federal wildlife laws, manages migratory bird populations, restores nationally significant fisheries, conserves and restores vital wildlife habitat, protects and recovers endangered species, and helps other governments with conservation efforts. In addition, the Service administers a federal aid program that distributes hundreds of millions of dollars to states for fish and wildlife restoration, boating access, hunter education, and related programs across America.

### National Wildlife Refuge System

In 1903, President Theodore Roosevelt designated the 5.5-acre Pelican Island in Florida as the nation's first wildlife refuge for the protection of brown pelicans and other native, nesting birds. This small but significant designation was the beginning of the Refuge System.

One hundred years later, the Refuge System has become the largest network of lands in the world specifically managed for wildlife, encompassing over 96 million acres within 546 refuges and over 3,000 small areas for waterfowl breeding and nesting. Today, there is at least one refuge in every state as well as Puerto Rico, Guam, and the U.S. Virgin Islands.

In 1997, the Improvement Act established a clear mission for the Refuge System.

*The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*

The Improvement Act states that each national wildlife refuge (that is, each unit of the Refuge System) shall be managed

- to fulfill the mission of the Refuge System;
- to fulfill the individual purposes of each refuge;
- to consider the needs of fish and wildlife first;
- to fulfill the requirement of developing a CCP for each unit of the Refuge System and fully involve the public in the preparation of these plans;
- to maintain the biological integrity, diversity, and environmental health of the Refuge System;
- to recognize that wildlife-dependent recreation activities including hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation, are legitimate and priority public uses;
- to retain the authority of refuge managers to determine compatible public uses.

In addition to the mission for the Refuge System, the wildlife and habitat vision for each unit of the Refuge System stresses the following principles:

- Wildlife comes first.
- Ecosystems, biodiversity, and wilderness are vital concepts in refuge and district management.
- Habitats must be healthy.
- Growth of refuges and wetland management districts must be strategic.
- The Refuge System serves as a model for habitat management with broad participation from others.

Following passage of the Improvement Act, the Service immediately began to carry out the direction of the new legislation, including preparation of CCPs for all national wildlife refuges and wetland management districts. Consistent with the Improvement Act, the Service prepares all CCPs in

conjunction with public involvement. Each refuge and each district is required to complete its CCP within the 15-year schedule (by 2012).

## People and the Refuge System

The nation's fish and wildlife heritage contributes to the quality of American lives. Wildlife and wild places provide special opportunities to recreate, relax, and enjoy the natural world.

Whether through bird watching, fishing, hunting, photography, or other wildlife pursuits, wildlife recreation contributes millions of dollars to local economies. In 2002, approximately 35.5 million people visited the Refuge System, mostly to observe wildlife in their natural habitats. Visitors are most often accommodated through nature trails, auto tours, interpretive programs, and hunting and fishing opportunities. Significant economic benefits are being generated to the local communities that surround refuges and wetland management districts. Economists report that Refuge System visitors contribute more than \$792 million annually to local economies.

## NATIONAL AND REGIONAL MANDATES

Refuge System units are managed to achieve the mission and goals of the Refuge System, along with the designated purpose of the refuges and districts (as described in establishing legislation, executive orders, or other establishing documents). Key concepts and guidance of the Refuge System are in the Refuge System Administration Act of 1966 (Administration Act), Title 50 of the Code of Federal Regulations (CFRs), "The Fish and Wildlife Service Manual," and the Improvement Act.

The Improvement Act amends the Administration Act by providing a unifying mission for the Refuge System, a new process for determining compatible public uses on refuges and districts, and a requirement that each refuge and district be managed under a CCP. The Improvement Act states that wildlife conservation is the priority of Refuge System lands and that the Secretary of the Interior will ensure the biological integrity, diversity, and environmental health of refuge lands are maintained. Each refuge and district must be managed to fulfill the Refuge System's mission and the specific purposes for which it was established. The Improvement Act requires the Service to monitor the status and trends of fish, wildlife, and plants in each refuge and district.

A detailed description of these and other laws and executive orders that may affect the CCP or the Service's implementation of the CCP is in appendix A. Service policies on planning and day-to-day

management of refuges and districts are in the "Refuge System Manual" and "The Fish and Wildlife Service Manual."

## REFUGE CONTRIBUTIONS TO NATIONAL AND REGIONAL PLANS

The Laramie Plains refuges contribute to the conservation efforts described here.

### Fulfilling the Promise

A 1999 report, "Fulfilling the Promise, The National Wildlife Refuge System" (U.S. Fish and Wildlife Service [USFWS] 1999), is the culmination of a yearlong process by teams of Service employees to evaluate the Refuge System nationwide. This report was the focus of the first national Refuge System conference in 1998 attended by refuge managers, other Service employees, and representatives from leading conservation organizations.

The report contains 42 recommendations packaged with three vision statements dealing with wildlife and habitat, people, and leadership. This CCP deals with all three of these major topics. The planning team looked to the recommendations in the document for guidance during CCP planning.

### Partners in Flight

The Partners in Flight program began in 1990 with the recognition of declining population levels of many migratory bird species. The challenge, according to the program, is managing human population growth while maintaining functional natural ecosystems. To meet this challenge, Partners in Flight worked to establish priorities for conservation efforts and identify land bird species and habitat types. Partners in Flight activity has resulted in 52 bird conservation plans covering the continental United States.

The primary goal of Partners in Flight is to provide for the long-term health of the bird life of North America. The first priority is to prevent the rarest species from going extinct, the second is to prevent uncommon species from descending into threatened status, and the third is to "keep common birds common."

There are 58 physiographic areas, defined by similar physical geographic features, wholly or partially contained within the contiguous United States and several others wholly or partially in Alaska. The Laramie Plains refuges fall within physiographic area 86, the Wyoming Basin (see figure 2).



The Wyoming Basin is primarily in Wyoming but also extends into northern Colorado, southern Montana, and very small parts of northeast Utah and southeast Idaho. The area consists of broad intermountain basins interrupted by isolated hills and low mountains that merge to the south into a dissected plateau. The Wyoming Basin is primarily shrub-steppe habitat, dominated by sagebrush and shadscale, interspersed with areas of short-grass prairie. Higher elevations are in mountain shrub vegetation, with coniferous forest atop the highest areas. Priority bird populations and habitats of the Wyoming Basin include the following:

#### Shrub-Steppe

Ferruginous hawk  
Prairie falcon  
Greater sage-grouse  
Cassin's kingbird  
Sage thrasher  
Brewer's sparrow  
Sage sparrow

#### Sagebrush Grasslands

Swainson's hawk  
Mountain plover  
McCowan's longspur

#### Montane Shrub

Lewis's woodpecker  
Virginia's warbler

#### Wetlands

American white pelican  
Wilson's phalarope

### Recovery Plans for Federally Listed Threatened or Endangered Species

Where federally listed threatened or endangered species occur at the Laramie Plains refuges, management goals and strategies in their respective recovery plans will be followed. The list of threatened or endangered species that occur at the refuges will change as species are listed or delisted, or as listed species are discovered on refuge lands.

At the time of plan approval, the Wyoming Toad Recovery Plan (U.S. Fish and Wildlife Service [USFWS] 1991) is in effect at Mortenson Lake NWR, the only refuge covered by this CCP that provides habitat for the endangered Wyoming toad. Reports of Preble's meadow jumping mouse have been documented at Hutton Lake NWR. The Service conducted a biological evaluation of the actions in this CCP per section 7 of the Endangered Species Act (see appendix M).

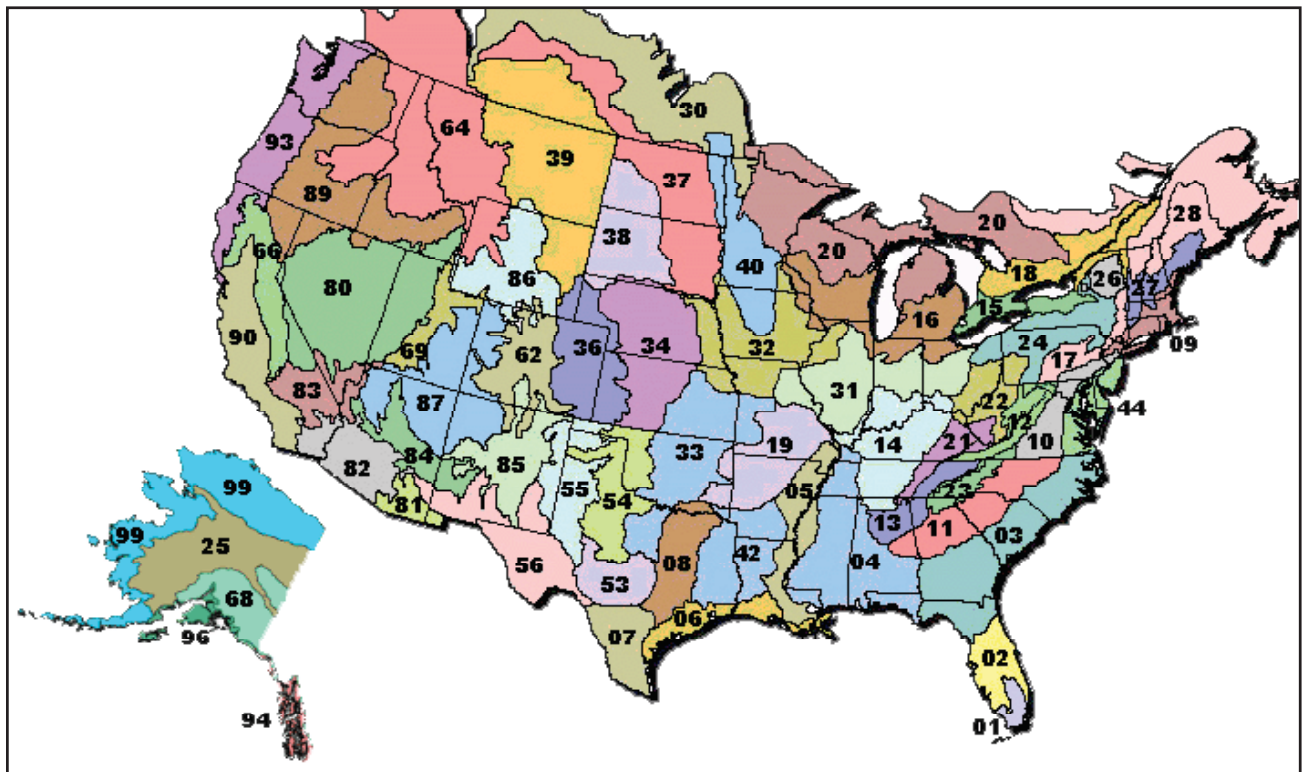


Figure 2. The Laramie Plains refuges are located in the Wyoming Basin, physiographic area 86.

## State Comprehensive Wildlife Conservation Strategy

Over the past several decades, documented declines of wildlife populations have occurred nationwide. Congress created the State Wildlife Grant (SWG) program in 2001. This program provides states and territories with federal dollars to support conservation aimed at preventing wildlife from becoming endangered and in need of protection under the Endangered Species Act. The SWG program represents an ambitious endeavor to take a proactive role in keeping species from becoming threatened or endangered in the future.

According to the SWG program, each state or territory and the District of Columbia must complete a comprehensive wildlife conservation strategy (CWCS) by October 1, 2005, to receive future funding.

The CWCS for the state of Wyoming was reviewed and information therein was used during the development of the CCP. Implementation of CCP habitat goals and objectives will support the goals and objectives of the CWCS.

## ECOSYSTEM DESCRIPTION AND THREATS

The Laramie Plains refuges are located within the Platte–Kansas Rivers ecosystem, which includes almost all of Nebraska, southeast Wyoming, northeast Colorado, and northern Kansas (figure 3). The ecosystem is home to the Nebraska Sandhills, the largest sand dune complex in the western hemisphere. This area and many others provide vital habitat for numerous threatened and endangered wildlife and plant species.

The ecosystem spans from snow-capped, barren mountain peaks in Colorado to lowland riparian cottonwood forests along the Missouri River in eastern Nebraska and Kansas. The mountainous regions are predominately a mixture of coniferous forests comprised of Douglas-fir, ponderosa pine, lodgepole pine, Engelmann spruce, and subalpine fir. Pinyon pine, juniper woodlands, and aspen communities are also common throughout. At high elevation, alpine meadows and lakes, willow shrub lands, and barren, rocky areas are frequently found. Forests generally transition into shrub communities dominated by sagebrush with short grasses and forbs in eastern Wyoming and western Nebraska. Farther to the east, trees give way to short-grass prairie dominated by buffalo grass, blue grama, hairy grama, and western wheatgrass. The short-grass prairie turns into mixed-grass prairie in central Nebraska and Kansas, due primarily to greater annual rainfall. Many federally listed endangered and threatened species including the

bald eagle, piping plover, whooping crane, and Eskimo curlew are found within this ecosystem. Threats to the Platte–Kansas Rivers ecosystem that require attention include overgrazing of land, invasive plants in the area, population growth and housing development, and groundwater and surface-water depletion. To overcome these threats, the priorities for the ecosystem will be to ensure that natural, healthy ecological processes dominate and that economic development complements environmental protection.

## Refuge Relationship

The Laramie Plains refuges lie within the Laramie Basin. The Laramie Basin is at an elevation of between 7,200 and 7,500 feet above sea level; it is a semiarid, intermountain basin characterized by a predominant vegetation of short grasses and sagebrush.

## THE PLANNING PROCESS

This CCP for the three Laramie Plains refuges is intended to comply with the Improvement Act and the NEPA as well as the implementing regulations of the acts. The Service issued its Refuge System planning policy in 2000, which established requirements and guidance for refuge and district plans—including CCPs and step-down management plans—to ensure that planning efforts comply with the Improvement Act. The planning policy identifies several steps of the CCP and EA process (also see figure 4):

- Form a planning team and conduct preplanning.
- Initiate public involvement and scoping.
- Draft the vision statement and goals.
- Develop and analyze alternatives, including the proposed action.
- Prepare the draft CCP and EA.
- Prepare and adopt the final CCP and EA and issue a “finding of no significant impact” (FONSI) or determine if an environmental impact statement is needed.
- Implement the CCP; monitor and evaluate.
- Review the CCP every 5 years and revise it every 15 years.

The Service began the preplanning process in January 2006. The planning team consisted of Service personnel from various divisions including refuges, planning, education and visitor services, ecological services, and the Wyoming Game and Fish Department. A list of planning team members and

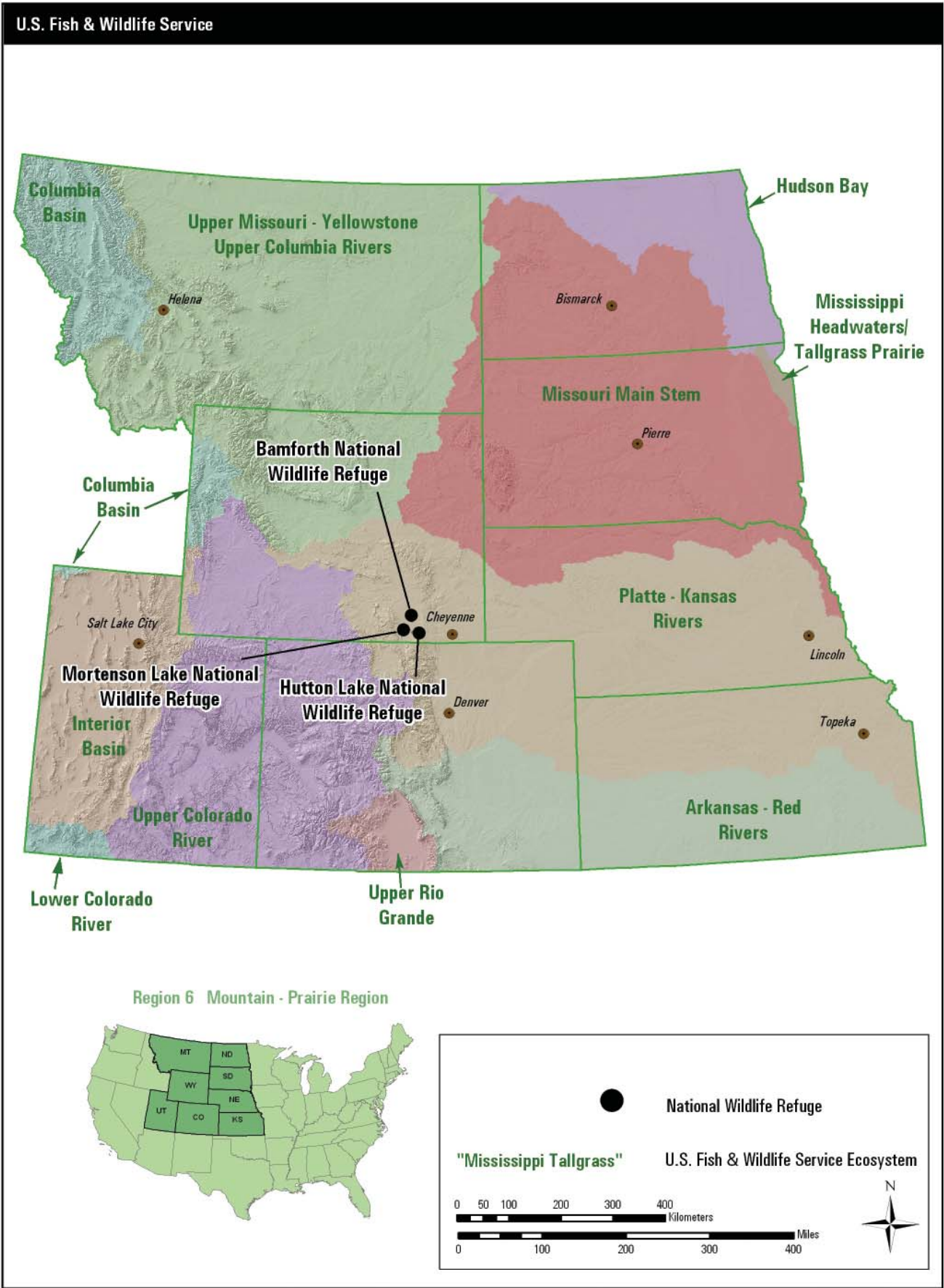


Figure 3. Platte-Kansas Rivers ecosystem.



other major contributors to the development of this CCP is in appendix C.

The Service developed three unique management alternatives based on the issues, concerns, and opportunities expressed during the scoping process.

The evaluation of the alternatives was documented in “Draft Comprehensive Conservation Plan and Environmental Assessment—Bamforth National Wildlife Refuge, Hutton Lake National Wildlife Refuge, Mortenson Lake National Wildlife Refuge,” which was published in August 2007. After the public comment period for the draft CCP and EA, the Service finalized the CCP.

## Coordination with the Public

The Service held two public scoping meetings in May 2006 (see table 1 for details) announced by the local media. During the public meetings, a description of the CCP and NEPA process was provided. Participants were asked to provide suggestions on the scope of issues to be considered in the planning process, and comments were recorded and entered in the planning record. Attendees were encouraged to ask questions and offer comments; each attendee was given a comment form to submit additional thoughts or questions in writing.

Approximately 51 people attended the public meetings. Attendees included local citizens and members of the Laramie Audubon Society, the Wyoming Outdoor Council, and the Biodiversity Conservation Alliance.

Written comments were due July 17, 2006. A total of 70 written comments were received throughout the scoping process. Input obtained from meetings and correspondence including email was considered in development of this draft CCP and EA.

A mailing list of more than 148 contacts includes private citizens; local, regional, and state government representatives and legislators; other federal agencies; and interested organizations (see appendix D).

In September 2006, the first planning update was sent to everyone on the mailing list. Information was provided on the history of the refuges and the CCP process, along with an invitation to share ideas regarding refuge management with the planning team. Each planning update included a comment form and postage-paid envelope to give the public an opportunity to provide written comments.

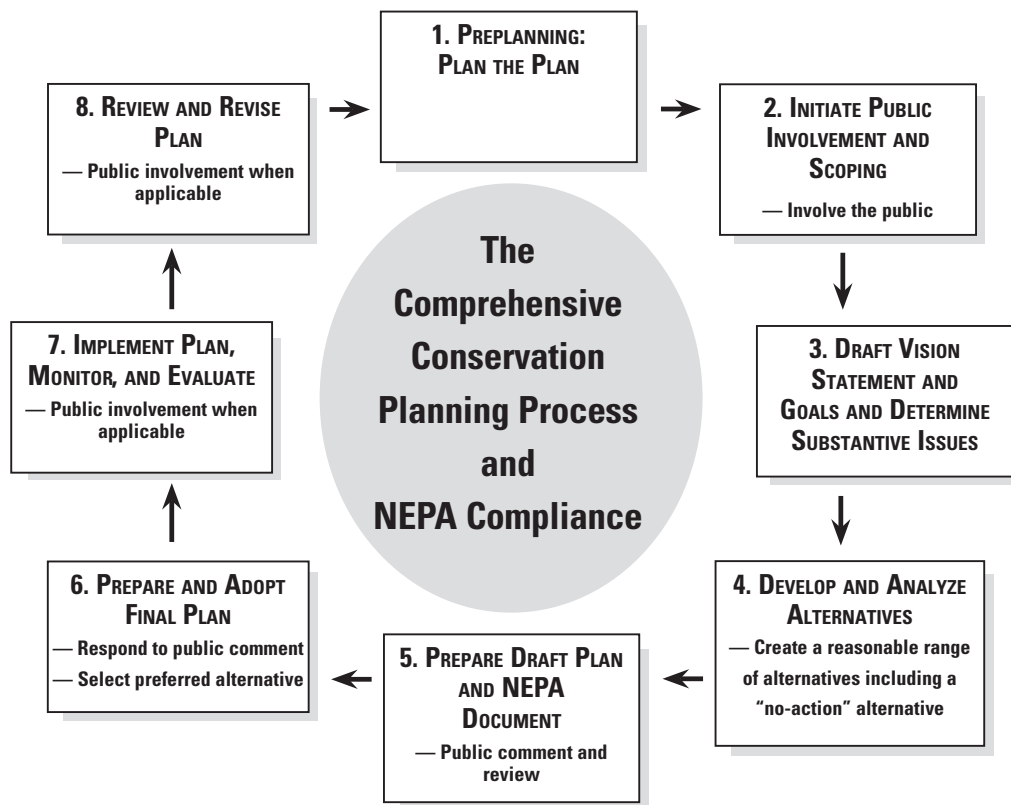


Figure 4. The planning process.

## State Coordination

On January 27, 2006, an invitation letter to participate in the CCP process was sent by the Service's region 6 director to the director of the Wyoming Game and Fish Department (WGF). Two representatives from the WGF are part of the CCP planning team. Local WGF wildlife biologists and the refuge staff had established excellent and ongoing working relations before starting the CCP process.

The Wyoming Game and Fish Department is charged with providing "an adequate and flexible system for the control, management, protection, and regulation of all Wyoming wildlife." The WGF maintains 36 Wildlife Habitat Management Areas and 96 Public Access Areas, encompassing 410,000 acres of managed lands for wildlife habitat and public recreation opportunity. These lands contain 121 miles of stream easements and about 21,014 surface acres of lakes and reservoirs for public access.

## Tribal Coordination

On October 17, 2006, five Native American tribal governments (Arapaho, Crow, Northern Cheyenne, Oglala Sioux, and Shoshone) were contacted

through a letter signed by Service's region 6 director. With information about the upcoming CCP, the letter invited tribal recipients to serve on the planning team. Although Native American tribal governments did not express interest in participating on the planning team, the tribal governments remain on the CCP mailing list and will continue to receive CCP correspondence.

## Results of Scoping

Table 1 summarizes all scoping activities. Comments collected from scoping meetings and correspondence, including comment forms, were used in the development of a final list of issues that were addressed in the draft CCP and EA.

The Service determined which alternatives could best address these issues. The planning process ensures that issues with the greatest effect on the refuges are resolved or given priority over the life of the final CCP. Identified issues, along with a discussion of effects on resources, are summarized in chapter 2.

In addition, the Service considered suggested changes to current refuge management presented by the public and other groups.

**Table 1. Planning process summary for the Laramie Plains refuges, Wyoming.**

<i>Date</i>	<i>Event</i>	<i>Outcome</i>
January–March 2006	Preplanning.	CCP overview; established planning team; identified purpose of the refuges, history, and establishing authority; developed planning schedule and CCP mailing list.
March 23, 2006	Kickoff meeting.	Toured refuges; conducted internal scoping by developing issues and qualities list for the refuges; identified biological and mapping needs; developed a vision statement for the refuges.
May 8, 2006	News release for public meeting sent to Wyoming media contacts.	Notified public of opportunities for involvement in the CCP process.
May 24, 2006	Public meeting in Casper, WY.	Opportunity for the public to learn about the CCP and offer suggestions on the scope of issues to be considered in the planning process.
May 25, 2006	Public meeting in Laramie, WY.	Opportunity for the public to learn about the CCP and offer suggestions on the scope of issues to be considered in the planning process.
June 16, 2006	NOI (to prepare the CCP) published in the “Federal Register.”	Notified the public of the intention to prepare a CCP and EA for the Laramie Plains refuges.
July 27, 2006	Goals and alternatives workshop.	Goals developed; alternatives discussed.
September 2006	Planning update distributed to CCP mailing list.	Planning update (describing CCP process and providing opportunity for public suggestions on the scope of issues to be considered in the planning process).
September 26, 2006	Environmental consequences workshop and identification of the proposed action.	Reviewed the anticipated environmental consequences; identified alternative B as the proposed action.
October 20, 2006	Objectives workshop.	Reviewed the proposed objectives, strategies, and rationale for implementation of the proposed action (draft CCP).
June 2007	Internal review of the draft CCP and EA.	Received comments on the draft CCP and EA.
August 2007	Release of draft CCP and EA for public review.	Draft CCP and EA presented to the public; received comments on the revised draft CCP and EA.
August 29, 2007	Public meeting in Laramie, WY.	Increased public understanding of the draft CCP and EA; received public comments on the draft CCP and EA.
September 2007	CCP approval.	Selection of the preferred alternative (B) for the final CCP.

## 2 The Refuges

Two of the three Laramie Plain refuges, Bamforth and Hutton Lake, were established by executive orders in 1932 within one day of each other. The third refuge, Mortenson Lake, was established in 1993 under the Endangered Species Act to protect the endangered Wyoming toad.



*Bamforth National Wildlife Refuge.*

USFWS



*Hutton Lake National Wildlife Refuge.*

USFWS



*Mortenson Lake National Wildlife Refuge.*

USFWS

### ESTABLISHMENT, ACQUISITION, AND MANAGEMENT HISTORY

Located within 15 miles of Laramie, Wyoming, the Laramie Plains refuges are managed by Service staff headquartered at the Arapaho NWR near Walden, Colorado, about 65 miles southwest of Laramie.

Laramie is positioned in a high plains basin ecosystem known as the Laramie Basin. The shallow

depressions of the basin, within the relatively flat topography of the region, support wetland complexes that are unique to the area. These wetland complexes provide resting, nesting, and breeding areas for migratory birds in the semiarid environment.

In the early 1930s, J. Clark Salyer III was charged with identifying areas to protect as national wildlife refuges for migratory birds. He surveyed the area around Laramie and selected two locations as national wildlife refuges for migratory birds. Bamforth NWR and Hutton Lake NWR were established by executive orders in 1932 within one day of each other.

Bamforth National Wildlife Refuge was established on January 29, 1932, by Executive Order 9321 (figure 5). Consisting of 1,166 acres, the refuge is located approximately 6 miles northwest of Laramie. The refuge was established with 201 acres withdrawn from the public domain in 1932, and 965 acres purchased with Migratory Bird Conservation Act (Migratory Bird) funds in 1933.

Due to a number of factors, Bamforth NWR has remained within the Refuge System but has not been actively managed. The refuge comprises three parts arranged roughly in an L-shaped pattern, with the segments one-half mile apart. Lands adjacent to and in between refuge parcels are owned by the state of Wyoming and private parties. The refuge is located in a closed basin hydrologic system that contains Bamforth Lake, but most of the lake falls outside the refuge boundary. The fragmented parcels, closed basin hydrology, and minimal water rights have contributed to the lack of active management of this refuge.

Hutton Lake National Wildlife Refuge was established on January 28, 1932, by Executive Order 5782 (figure 6). Consisting of 1,928 acres, the refuge is located approximately 10 miles southwest of Laramie. In 1932, 153 acres were withdrawn from the public domain for the establishment of this refuge. Additional lands were purchased with Migratory Bird funds in 1933 and 1939. In 1940, 147 acres were exchanged, which completed the current 1,928 acres comprising Hutton Lake NWR. Physical features of the refuge include Hutton Lake, Rush Lake, Creighton Lake, and Lake George. Mallards, redheads, teal, pintails, great blue herons, black-crowned night-herons, phalaropes, western grebes, bitterns, and black terns use the refuge during fall and spring migrations.



With some water rights at Hutton Lake NWR, the Service manages Lake George and Creighton, Hutton, Hoge, and Rush lakes for migratory birds. Water management is opportunistic due to limited water rights and a closed basin system. Ponds are filled in the spring with natural runoff and maintained as high as possible over the birds' breeding and brood-rearing seasons (June–August).

Hutton Lake NWR supports approximately 2,000 visits over the course of a year, mostly from March through October. Wildlife-viewing opportunities and refuge access is limited from November through February due to frozen ponds and cold, snowy weather.

Mortenson Lake National Wildlife Refuge was established in 1993 under the Endangered Species Act to protect the endangered Wyoming toad (figure 7). The Service purchased an additional 151 acres for the refuge in 2003. The 1,968-acre refuge is located 15 miles southwest of Laramie. Within the refuge's approved acquisition boundary, 598 acres remain in private ownership. Protection for the Wyoming toad would improve if the Service could purchase these lands from willing sellers. Physical features of the refuge include Mortenson, Soda, and Garber lakes and Gibbs Pond. Last Chance, Osterman, and South ditches cross the refuge. Habitat types include open water, wetlands, wet meadow, grassland, sagebrush, and greasewood communities.



*Great blue heron.*

USFWS

## SPECIAL VALUES OF THE REFUGES

Early in the planning process, the planning team and public identified the outstanding qualities of the Laramie Plains refuges, the characteristics and features that make it special to people, valuable for wildlife, and worthy of refuge status. Identifying these values at the outset helps ensure they will be preserved, protected, and enhanced throughout the planning process. Refuge qualities can range from providing a unique biological habitat for wildlife to offering visitors a quiet place to observe a variety of birds and enjoy nature. The following summarizes the qualities that make the Laramie Plains refuges unique and valued:

- The wetland complexes of the refuges provide important water resources that support resting, nesting, and foraging areas for migratory birds in the semiarid environment of the Laramie Plains basin.
- A diversity of wetland habitat within the refuges provides a range of conditions (i.e., varying amounts of emergent and aquatic vegetation, salinity, and open water) that support a variety of wildlife species.
- The nearby University of Wyoming and Colorado State University are resources for natural resource studies to add to the body of scientific literature on semiarid environments and the importance of national wildlife refuges in the western United States.
- Two vegetative species of concern have been identified on Mortenson Lake NWR and Hutton Lake NWR. Alkali wildrye is a meadow grass occurring at its northern limits on the refuges. Pale blue-eyed grass is a wet-meadow plant in the iris family endemic to southeastern Wyoming and north-central Colorado.
- The refuges contain native short-grass prairie habitat, which is unique in the state of Wyoming (species of special concern that use short-grass prairie include mountain plover, burrowing owl, sage-grouse, and McCown's longspur).
- The refuges are located near an urban population center (Laramie) and can be used as outdoor classrooms to provide environmental education opportunities for the local community.
- Visitors can find wide-open spaces that remain relatively undisturbed, and may often feel as if they have the place to themselves.



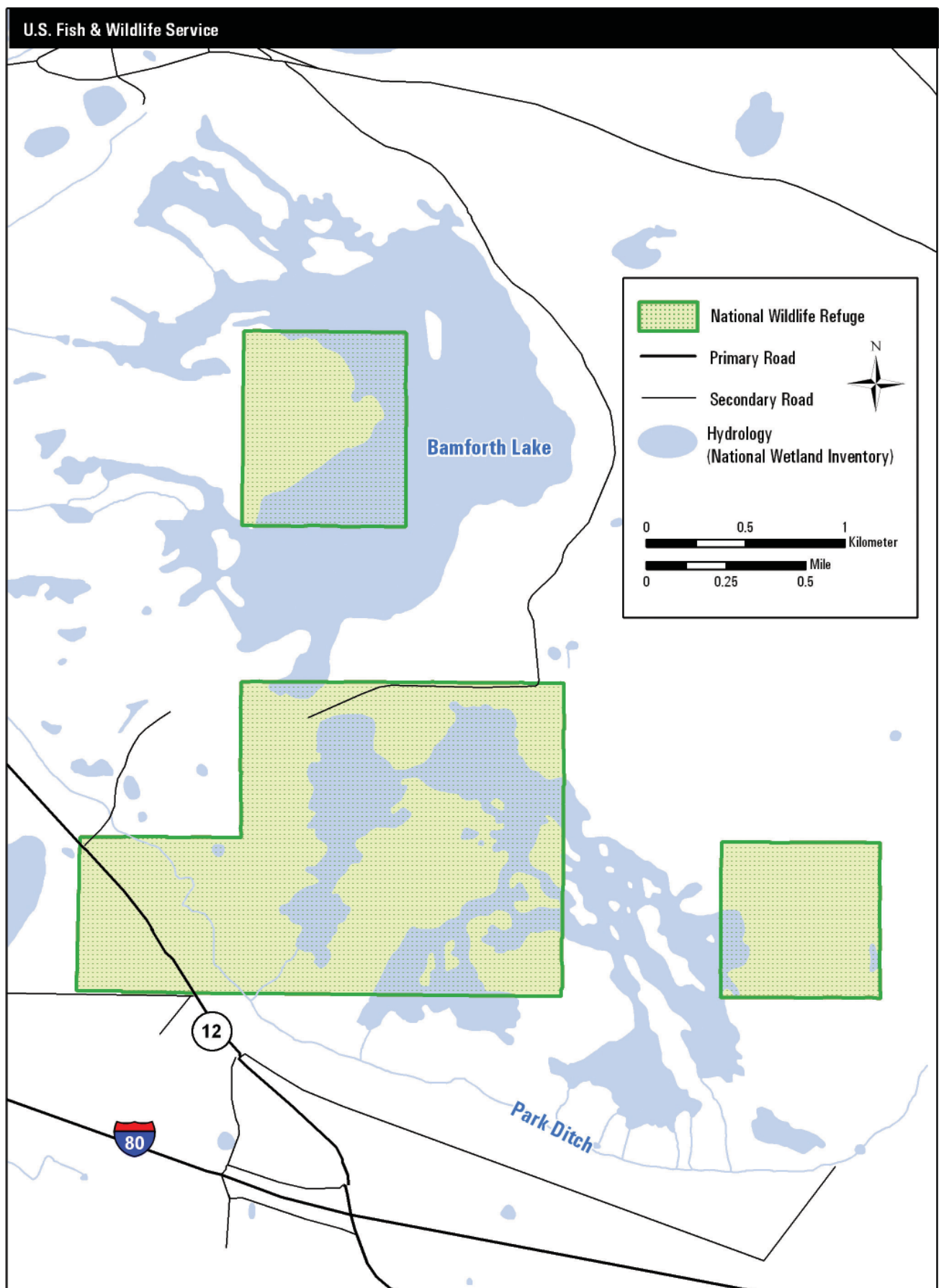


Figure 5. Base map of Bamforth NWR, Wyoming.

- The refuges are designated as Important Bird Areas by the Wyoming Audubon Society.
- Mortenson Lake NWR harbors the endangered Wyoming toad.

## PURPOSE

Every refuge is established for a purpose. This purpose is the foundation upon which to build all refuge programs, from biology and public use to maintenance and facilities. No action that the Service or public takes may conflict with this refuge purpose. The refuge purpose is found in the legislative acts or administrative orders, which are the authorities to either transfer or acquire a piece of land for a refuge. Over time an individual refuge may contain lands that have been acquired under a variety of transfer and acquisition authorities, giving it more than one purpose. The goals, objectives, and strategies identified in the CCP are intended to support the individual purpose for which the refuge was established.

Bamforth NWR was established by Executive Order 5783, January 29, 1932. The purpose of the refuge is to provide “a refuge and breeding ground for birds and wild animals.”

Hutton Lake NWR was established by Executive Order 5782, January 28, 1932. The purpose of the refuge is to provide “a refuge and breeding ground for birds and wild animals.”

Mortenson Lake NWR was established in 1993 to protect the Wyoming toad’s last known population. The Wyoming toad was listed as an endangered species in 1984. The population at Mortenson Lake was found in 1987. The purpose of the refuge is “to conserve fish or wildlife which are listed as endangered species or threatened species.”

## VISION

At the beginning of the planning process, the Service developed a vision for the Laramie Plains refuges. A vision describes what will be different in the future as a result of the CCP and is the essence of what the Service is trying to accomplish at the refuges. The vision is a future-oriented statement designed to be achieved through refuge management by the end of the 15-year CCP planning horizon. The vision for the Laramie Plains refuges is:

*The wetland complexes and uplands of the Laramie Plains refuges are important resource components of this semiarid region that provide key habitat for the Wyoming toad, migratory birds, and resident wildlife.*

*These refuges will be evaluated to direct management decisions to provide natural and enhanced habitat, thereby maximizing the unique potential of each refuge. Wildlife-dependent recreation will be evaluated for each refuge to determine potential, appropriate public use opportunities.*

## GOALS

The Service also developed a set of goals for the refuges based on the Improvement Act, the refuge purposes, and information developed during project planning. The goals direct work toward achieving the vision and purpose of the refuge and outline approaches for managing refuge resources. The goals for the refuges are detailed below.

### The Laramie Plains Refuges

The following goals apply to all three Laramie Plains refuges.

**Research and Science Goal:** Conduct natural resource management using sound science and applied research to advance the understanding of natural resource function.

**Partnerships Goal:** Work with partners to determine the wildlife and habitat resources on the refuges, to maximize wildlife habitat protection, and to increase understanding of wildlife needs, as well as the benefits wildlife offer to individuals and communities, on and off the refuges.

**Cultural Resources Goal:** Identify and evaluate the cultural resources on the refuges and protect those that are determined to be significant.

**Refuge Operations Goal:** Secure and demonstrate the effective use of funding, staffing, and partnerships for the benefit of all resources in support of the refuges and the Refuge System.

### Bamforth NWR

The following refuge-specific goal was identified for Bamforth NWR.

**Natural Resources Goal:** Conduct baseline surveys to identify refuge resources and the role they serve in the Laramie Basin ecosystem and the Refuge System.

### Hutton Lake NWR

The following refuge-specific goals were identified for Hutton Lake NWR.

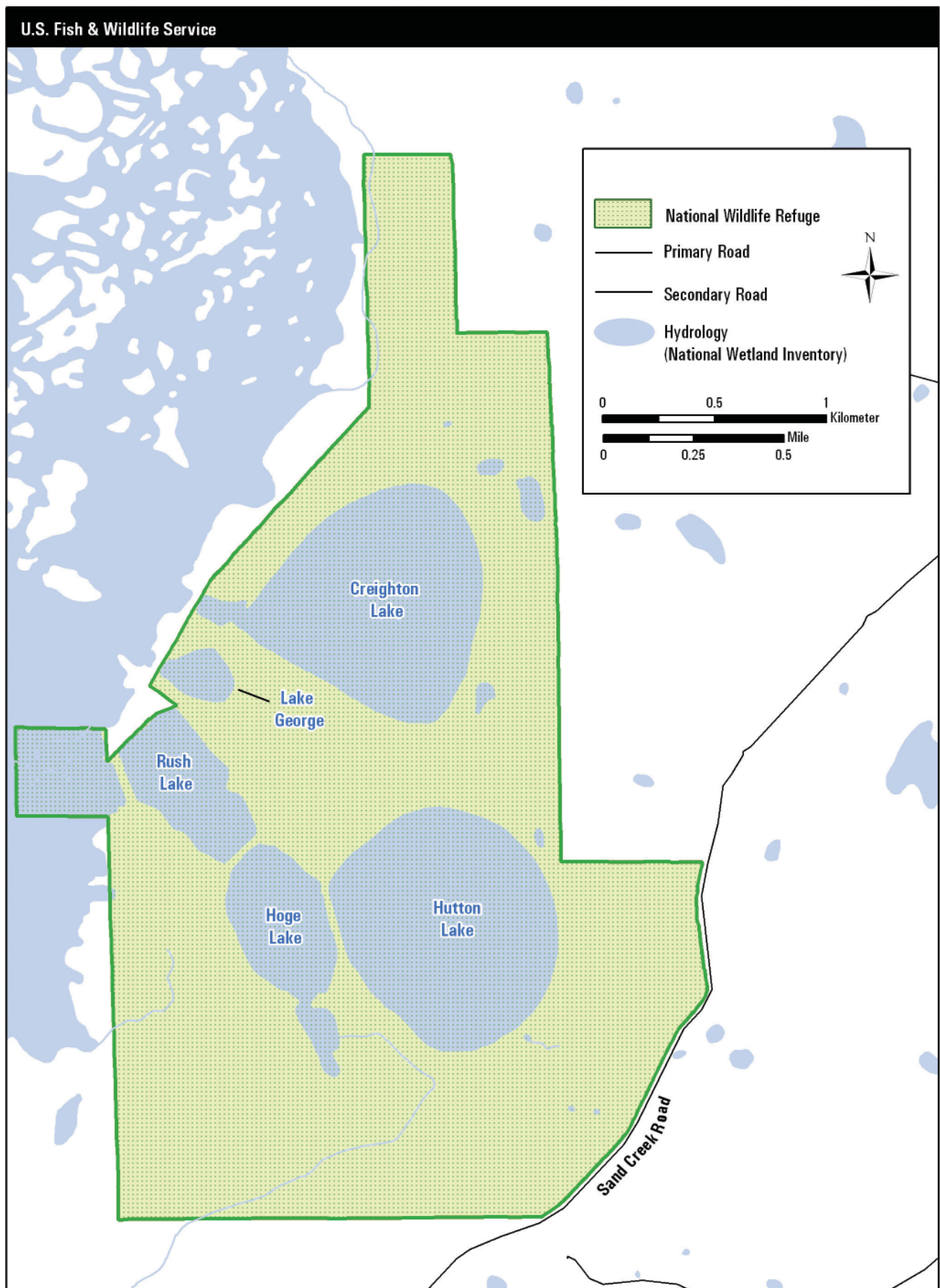


Figure 6. Base map of Hutton Lake NWR, Wyoming.



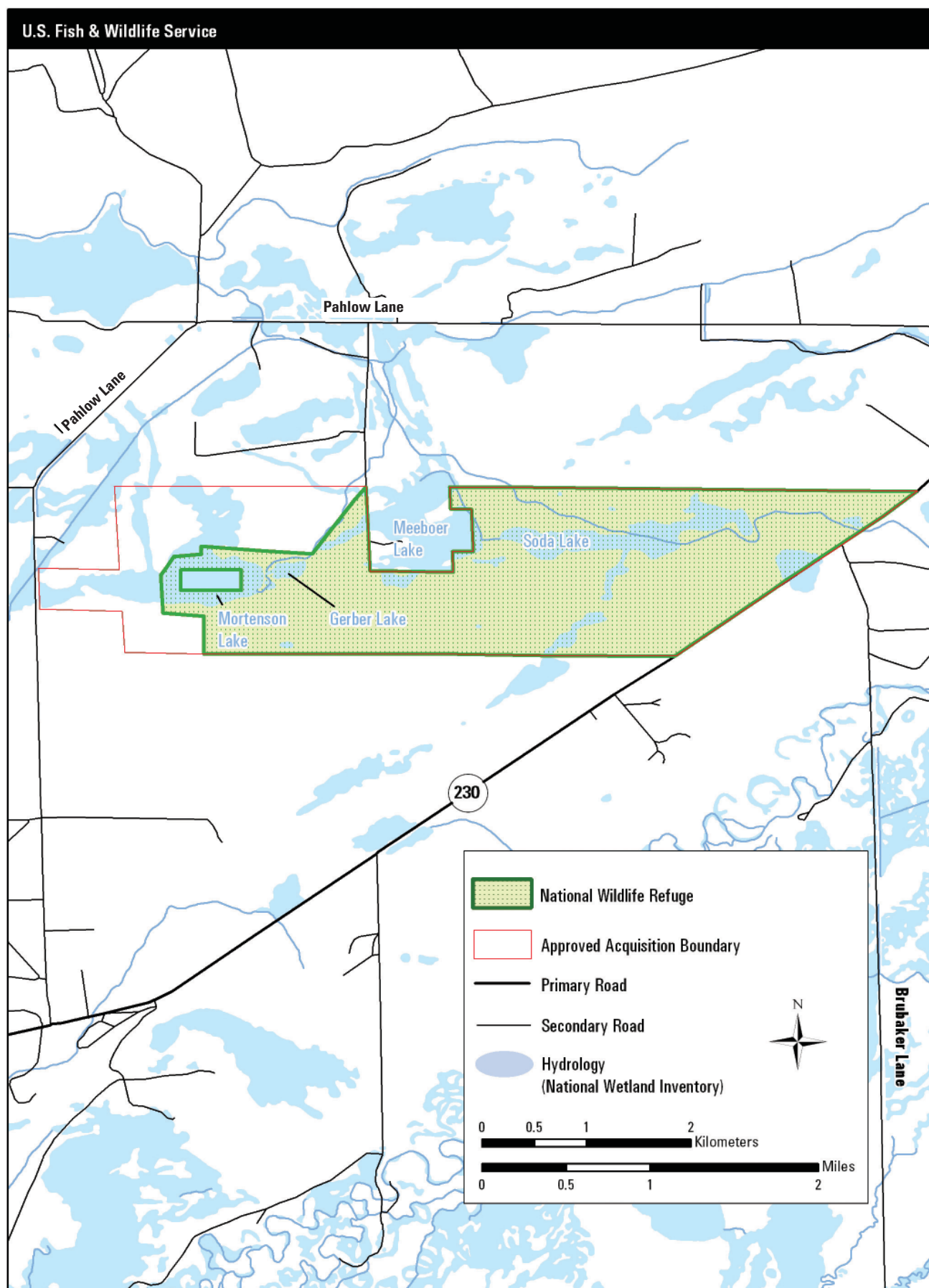


Figure 7. Base map of Mortenson Lake NWR, Wyoming.

**Wetlands Goal:** Manage refuge impoundments and other wetlands to create a diverse habitat for wetland-dependent wildlife.

**Uplands Goal:** Gather baseline biological information to guide evaluation and management of shrub- and grass-dominated uplands for benefit to migratory birds (willet, horned lark), white-tailed prairie dogs, pronghorn, and other wildlife.

**Visitor Services Goal:** Provide wildlife-dependent recreational opportunities to a diverse audience when the administration of these programs does not adversely affect habitat management objectives.

## Mortenson Lake NWR

The following refuge-specific goals were identified for Mortenson Lake NWR.

**Wyoming Toad Goal:** In conjunction with the Wyoming Toad Recovery Team, manage refuge lands around Mortenson Lake and other areas on the refuge as necessary to protect, create, and manage habitat suitable for Wyoming toad recovery from endangered status.

**Wetlands Goal:** Following considerations for Wyoming toad needs, manage refuge impoundments and other wetlands to create diverse habitat for wetland-dependent wildlife.

**Uplands Goal:** Following consideration for Wyoming toad needs, gather baseline biological information to guide evaluation and management of shrub- and grass-dominated uplands for the benefit of migratory birds, white-tailed prairie dogs, pronghorn, and other wildlife.

## PLANNING ISSUES

Several key issues were identified following the analysis of comments collected from refuge staff and the public, as well as a review of the requirements of the Improvement Act and the NEPA. Substantive comments (those that could be addressed within the authority and management capabilities of the Service) were considered during the formulation of the alternatives for future management. These key issues for the Laramie Plains refuges are summarized below.

### The Laramie Plains Refuges

The following planning issues apply to all three Laramie Plains refuges.

#### Refuge Uses

Refuge uses (grazing, recreation, transmission lines) need to be evaluated to ensure existing and

proposed uses are compatible with the purpose of the refuges and mission of the Refuge System. Refuge uses have not been actively evaluated over time due to minimal staff presence. Through the development of this CCP, refuge uses and management activities will be evaluated to ensure the best, most informed decisions are made for proper management of refuge lands.

#### Water Resources

Water and water availability are vital in semiarid regions. The limited water rights for these refuges can result in dry spring conditions and poor wildlife habitat for trust species. Acquiring additional water rights would enable the Service to consistently provide high-quality spring migration and nesting habitat for trust species. The Service needs to research the availability and feasibility of obtaining additional water rights for the refuges.

#### Invasive Species

Invasive species are a threat to quality habitat. If not contained early, they can also drain resources. Though the refuges do not have significant invasive species issues, vigilance is required. Tamarisk has been identified and managed at Hutton Lake NWR, but an increase in monitoring, management, and control of it and other invasive species is needed.

#### Research and Science

The Service needs to obtain good baseline biological information for the refuges. Monitoring programs need to be implemented for species that use the refuges. The University of Wyoming, located within 15 miles of the refuges, could be a partner in gathering quality research data on the refuges.

#### Land Protection

Areas of concern center on the small size of the individual refuges and a lack of buffer zones. Each refuge is less than 2,000 acres in size, and the refuges' proximity to Laramie and urban growth in the area pose a potential threat. Refuge advocates want to increase protections through conservation easements or expansions through willing seller acquisitions to ensure the refuges are large enough to preserve wildlife qualities.

#### Partnerships

Cooperation with other agencies is needed to address issues of common concern. Opportunities for the public to assist in protection and management of the refuges should be identified and provided.

#### Staffing

The refuges should be actively managed by Service staff stationed in Wyoming. This issue was raised



*Coyote.*

frequently in public meetings. The managing staff is headquartered at Arapaho NWR in Walden, Colorado, an hour's drive south of Laramie. The remote location and the small number of staff assigned to Arapaho NWR prevent active, consistent oversight of the Laramie Plains refuges.

## Bamforth NWR

The following planning issues apply only to Bamforth NWR.

### Lack of Information

Bamforth NWR has not been actively managed since its establishment in 1932. The refuge is not properly posted, fenced, or signed to indicate its status as a national wildlife refuge. The planning team struggled with a lack of information about the refuge's wildlife and habitat resources. The planning team discussed whether Bamforth NWR should maintain its national wildlife refuge status.

The Service's region 6 divestiture model was used to evaluate the refuge. The evaluation indicated the refuge should remain in the Refuge System, mainly due to insufficient information. The Service needs to obtain a good understanding of the refuge's resources before advocating divestiture or promoting public use. With the possibility of recommending divestiture of the refuge in the future, it would not be prudent to fund the development of the infrastructure needed to provide public use opportunities at this time. This plan strives to identify the resources and potential of the refuge to determine its appropriate role in the Refuge System.

### Public Use

The refuge is currently closed to public use and is not signed or fenced to mark the refuge boundaries. Until baseline biological information has been obtained to determine the role the refuge plays in the Refuge System, and whether divestiture of the refuge is warranted, it would not be prudent to invest resources in the development of infrastructure to safely support public use programs.

## Mortenson Lake NWR

The following planning issue applies only to Mortenson Lake NWR.

### Endangered Species

Mortenson Lake NWR was established for the endangered Wyoming toad. Although the refuge staff participates on the Wyoming Toad Recovery Team, not having a staff member specifically assigned to the Laramie Plains refuges has hindered management decisions and active, planned oversight of these lands for the Wyoming toad.



# 3 Refuge Resources and Description

Located in northern Wyoming in a high plains basin ecosystem known as the Laramie Basin, the Laramie Plains refuges lie near the center of the Mountain–Prairie Region. Bamforth NWR, Hutton Lake NWR, and Mortenson Lake NWR support wetland complexes that provide resting, nesting, and breeding areas for migratory birds in a semiarid environment. In addition, Mortenson Lake NWR provides habitat for the endangered Wyoming toad.

This chapter describes the refuges' setting, as follows:

- physical environment
- biological resources
- cultural resources
- special management areas
- visitor services
- socioeconomic environment
- operations



*Greater sage-grouse.*

## PHYSICAL ENVIRONMENT

This section describes global warming; climate; physiography, geography, and soils; land use; water resources; hydrology; water rights; and air quality.

### Global Warming

The U.S. Department of the Interior issued an order in January 2001 requiring federal agencies under its direction that have land management responsibilities to consider potential climate change effects as part of long-range planning endeavors.

The Department of Energy's report, "Carbon Sequestration Research and Development," concluded that ecosystem protection is important to carbon sequestration and may reduce or prevent loss of carbon currently stored in the terrestrial biosphere. The report defines carbon sequestration as "the capture and secure storage of carbon that would otherwise be emitted to or remain in the atmosphere."

The increase of carbon dioxide (CO<sub>2</sub>) within the earth's atmosphere has been linked to the gradual rise in surface temperature commonly referred to as "global warming." In relation to comprehensive conservation planning for Refuge System units, carbon sequestration constitutes the primary climate-related effect to be considered in planning.

Vegetated land is an important factor in carbon sequestration. Large, naturally occurring communities of plants and animals that occupy major habitats—grasslands, forests, wetlands, tundra, and desert—are effective both in preventing carbon emission and in acting as biological "scrubbers" of atmospheric CO<sub>2</sub>.

One service activity in particular—prescribed burning—releases CO<sub>2</sub> directly to the atmosphere from the biomass consumed during combustion yet results in no net loss of carbon because new vegetation quickly germinates and sprouts to replace the burned-up biomass. This vegetation sequesters an approximately equal amount of carbon as was lost to the air (Dai et al. 2006). Several other effects of climate change may need to be considered in the future:

- Habitat available in lakes and streams for cold-water fish such as trout and salmon could be reduced.
- Forests may change, with some plant species shifting their range northward or dying out and other trees moving in to take their place.
- Ducks and other waterfowl could lose breeding habitat because of stronger and more frequent droughts.
- Changes in the timing of migration and nesting could put some birds out of synchronization with the life cycles of their prey.

## Climate

The Laramie Basin is considered a cold desert with annual precipitation averaging 11.53 inches (High Plains Regional Climate Center 2006). The average maximum temperature is 53.8°F, average minimum temperature is 26.8°F, and extremes range from a summer high of 95°F to a record low of -50°F. The area is known for persistent windy conditions, and the growing season is short, typically from late May to early September (U.S. Department of Agriculture [USDA] 1998).

## Physiography, Geography, and Soils

The current physiography of the Laramie Basin was influenced by a shallow warm water sea, a crustal uplift affecting Colorado and southeast Wyoming, the Laramide Orogeny Mountain building episode, volcanic activity in the Yellowstone area, and influences of the ice ages. Most of the stable landforms in the area today were created within the last hundred thousand years by glacial outwash waters. Many of the soils therefore have alluvial origins (USDA 1998). The high, flat nature of much of Wyoming is conducive to strong winds, and several features on the land suggest that wind has played an important role in past geological development as well. Data suggest that the Laramie Basin—including Bamforth NWR—is a deflation hollow formed by wind action (Morrison 1991). Bamforth NWR is at about 7,000 feet in elevation with the benches reaching over 7,200 feet. Hutton Lake NWR and Mortenson Lake NWR lie between 7,200 feet and 7,300 feet.

## Land Use

The Laramie Basin lies within the aforementioned Wyoming Basin (see figure 2), a large percentage of which is in public ownership, with the Bureau of Land Management (BLM) owning much of the lower elevation shrub-steppe and grassland and the U.S. Forest Service owning a great deal of the higher-



*Rocky Mountain bee plant.*

USFWS

elevation wooded land. A checkerboard pattern of land ownership is a subtle problem that affects the consistency of land management over large areas. The primary land use in the Wyoming Basin has been for many years and continues to be grazing, although conversion to agriculture is also an issue. The effects of overgrazing and nonnative plant invasion should be mitigated to improve conditions for breeding birds. Maintenance of springs and riparian habitat may be crucial, particularly to sage-grouse. Fencing or changing grazing systems may be effective in maintaining water flow. Oil and gas extraction and hard rock mining are relatively recent factors that may negatively affect the greater landscape needs of the sage-grouse.

## Water Resources

This section describes the hydrology and water rights of the Laramie Plains refuges.

### Hydrology

The Laramie River is the primary water source for Albany County. With its headwaters beginning in the Rawah Mountains to the south in Colorado, as well as the Laramie Mountains to the east and Medicine Bow Mountains to the west, the river winds a course from south to north through the county, exits to the northeast, and ultimately empties into the North Platte River near Wheatland, Wyoming (USDA 1998).

### Water Rights

Water rights for the Laramie Plains refuges are listed in table 2.

### Air Quality

Air quality receives protection under several provisions of the Clean Air Act, including the



national ambient air quality standards (NAAQS) and the Prevention of Significant Deterioration program. NAAQS include maximum allowable pollution levels for particulate matter, ozone, sulfur dioxide, nitrogen dioxide, lead, and carbon dioxide.

Based on Wyoming's most current data, the state has relatively clean air. In the area of the refuges (Albany County), the levels of carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, particulate matter (diameter <2.5 micrometers), particulate matter (diameter <10 micrometers), and lead did not exceed federal standards at any monitoring site in 2006 (U.S. Environmental Protection Agency [EPA] 2007a).

The air quality index (AQI) is an approximate indicator of overall air quality, because it takes into account all of the criteria air pollutants measured within a geographic area. Air quality in Albany County is considered to be generally good, with no reported days of unhealthy air quality (EPA 2007b).

Prescribed burning is the refuge management activity that has the greatest effect on air quality (find more information in the description of the fire management program in appendix E). The management of smoke is incorporated into planning prescribed burns and, to the extent possible, in suppression of wildfires. Sensitive areas are identified and precautions are taken to safeguard visitors and local residents. Smoke dispersal is a consideration in determining whether a prescribed burn is within prescription. Generally, the fine-grass fuels and small burn size (80–600 acres) generate low volumes of smoke for short durations (4–5 hours).

## BIOLOGICAL RESOURCES

This section describes vegetation, wildlife, and their associated communities at the Laramie Plains refuges. Appendices F–I list species that can be found on the refuges for plants (appendix F), birds (appendix G), amphibians and reptiles (appendix H), and mammals (appendix I).

Major habitat types of the Laramie Plains refuges include open water wetlands, uplands consisting of brush and grasslands, alkali flats, and irrigated meadows. The location and distribution of the major habitat types for the refuges are shown in the habitat maps for Bamforth NWR (figure 8), Hutton Lake NWR (figure 9), and Mortenson Lake NWR (figure 10).

### Open-water Wetlands

The wetlands within the Laramie Plains refuges vary from natural basins to constructed impoundments and enhanced basins. The physical

look of the refuges wetlands ranges from complete open water to rimmed with emergent vegetation to dominated by emergents. Natural runoff somewhat influences these areas, but most water added to these wetlands comes from water rights from irrigation ditches adjudicated through the state of Wyoming. The ability to manage waters in the different impoundments varies considerably.

In Albany County's semiarid environment, the natural and enhanced lakes and ponds on the refuges, as well as the other impoundments, are tightly regulated by the Wyoming State Engineer's Office. Prior to European settlement of Wyoming in the nineteenth century, the Laramie Plains lakes were playas, filling in high runoff years and drying up completely during sustained droughts. Although there are several streams in the county, most of the lakes are independent of their influence from flooding. Following settlement, a series of irrigation ditches were constructed to provide flood irrigation waters for hay and crop production. These ditches probably aided in maintaining more reliable water levels for some of the plains lakes, as return irrigation flows were captured in them, and some of the basins were developed to serve as storage reservoirs for irrigation.



*Bulrush wetlands.*

USFWS

The lower-priority irrigation rights owned by the Service for the refuges often result in little or no irrigation water reaching refuge impoundments, which potentially mimics natural historic conditions, as the wetlands receive more water in good water years and little to no water in drought years. However, good snowpacks in the mountains can result in higher water availability in the irrigation system being available for the Laramie Plains lakes, a condition that may not have obtained in presettlement days. Wildlife is considered a viable water use category under Wyoming water law and is covered under either the irrigation or miscellaneous use categories.

**Table 2. Water rights for the Laramie Plains refuges, Wyoming.**

<i>Permit No.</i>	<i>Territorial Proof No.</i>	<i>Priority Date</i>	<i>Station</i>	<i>Name</i>	<i>Use</i>	<i>Amount of Irrigated Acreage (Acres)</i>
5617	—	03/19/1947	Mortenson Lake NWR	Soda Lake Draw #1 Reservoir	Irrigation and stock	—
20132	—	07/03/1947	Mortenson Lake NWR	Harmon ditch	Irrigation and stock	79.6
20459	—	07/13/1949	Mortenson Lake NWR	Soda Lake ditch	Irrigation, domestic, and stock	27.88
4454		07/29/1964	Mortenson Lake NWR	Johnson No. 1 Lake	Stock	—
4455	—	07/29/1964	Mortenson Lake NWR	Johnson No. 2 Lake	Stock	—
7259	—	04/14/1967	Mortenson Lake NWR	Mortenson Lake	Irrigation	—
U.W. 144046		04/22/2002	Mortenson Lake NWR	Field Well No. 1	Domestic and stock	—
—	4626	12/31/1871	Hutton Lake NWR	Red ditch	Irrigation	118 total; refuge has 10
—	4635	12/31/1888	Hutton Lake NWR	Richards ditch	Irrigation	45 total; refuge has 42
1962 RES	—	02/02/1892	Hutton Lake NWR	Hutton Lake Reservoir ditch	Irrigation	—
2304E	16648	06/03/1909	Hutton Lake NWR	King ditch enlargement and extension	Irrigation	579; refuge has portion
5212E	22925	09/11/1939	Hutton Lake NWR	First enlargement Hutton Lake	Irrigation and bird refuge	112
U.W. 76609	—	04/27/1988	Hutton Lake NWR	Well No. 1	Stock	—
—	561	08/27/1887	Bamforth Lake NWR	Park ditch (via Johnson Refuge ditch)	Irrigation and domestic	600 total; refuge has 120

**Table 2. cont. Water rights for the Laramie Plains refuges, Wyoming.**

<i>Location of Irrigated Acreage</i>	<i>Source</i>	<i>CFS Rate of Diversion</i>	<i>GPM Rate of Diversion</i>	<i>Storage in Acre-feet</i>	<i>Additional Information</i>
Storage water can be used anywhere on refuge and lands attached to Permit 20459	Soda Lake Draw	—	—	152.64 (first fill only—no refill)	Storage season begins October 1; adjudicated.
Section 3, 14N, 75W, 6th P.M.	Richard Draw	1.1	—	—	Direct flow right; unadjudicated.
NE 1/4, Section 3, 14N, 75W, 6th P.M.	Soda Lake Draw	2.29	—	—	Direct flow supplemental to April 19, 1879 right from Laramie River through Pioneer Canal; unadjudicated.
—	—	—	—	1.37	Unadjudicated (small stock reservoir).
—	—	—	—	1.72	Unadjudicated (small stock reservoir).
Storage water can be used on lands anywhere on refuge	Meeboer Draw	—	—	247.46 (first fill only—no refill)	Storage season begins October 1; unadjudicated.
—	Ground water	—	10	—	Not completed yet due to lack of funds.
NENW Section 17, 14N, 74W, 6th P.M.	Sand Creek	1.69; refuge 0.14	—	—	Adjudicated pursuant to December 27, 1912, Sand Creek Decree. “Priority No. 1.” Refuge owns a portion.
12A SESE, Section 18, 10A NWNW, 20A SWNW, Section 20, 14N, 74W, 6th P.M.	Sand Creek	0.64 total; refuge has 0.60	—	—	Adjudicated pursuant to December 27, 1912, Sand Creek Decree. “Priority No. 9.” Refuge owns a portion.
Not tied to specific acreage	Sand Creek	—	—	2500	Adjudicated pursuant to December 27, 1912, Sand Creek Decree. Diversion can occur when Sand Creek is above 58 cfs. “Priority No. 12.5.” Filed as a direct flow irrigation right.
Portion of Sections 17 and 20, 14N, 74W	Laramie River	8.27 total; refuge has a portion	—	—	Adjudicated pursuant to December 27, 1912, Laramie River Decree. Refuge owns a portion.
Portion of Sections 17 and 20, 14N, 74W, 6th P.M.	Sand Creek	1.6	—	—	Subsequent to December 27, 1912, Sand Creek Decree.
—	Ground water	—	3	—	—
30A NESE, 10A SESE, Section 12, 80A W1/2SE, Section 8, 16N, 75W, 6th P.M.	Little Laramie River	8.57 total; refuge has 1.71	—	—	—

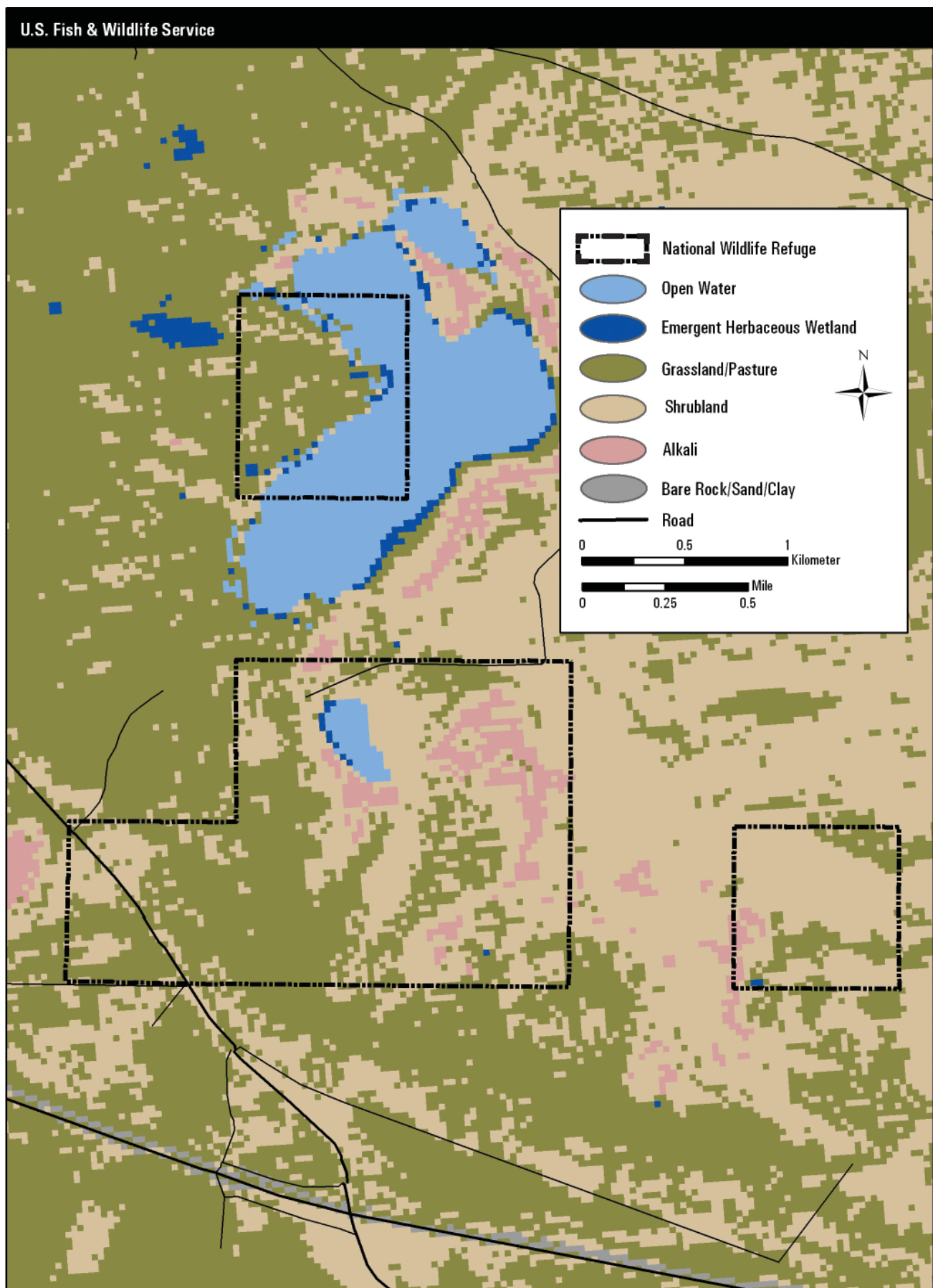


Figure 8. Habitats at Bamforth NWR, Wyoming.



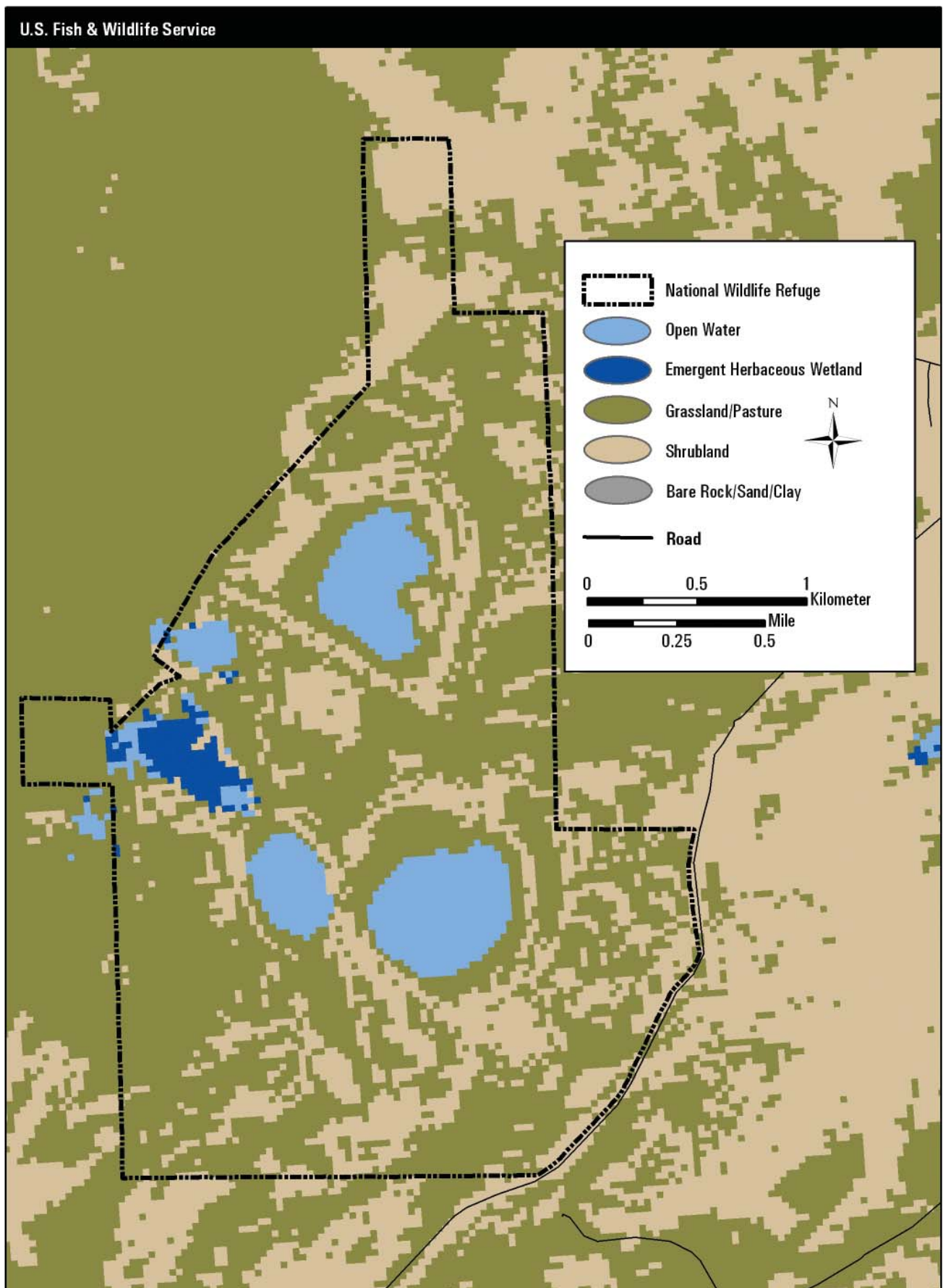


Figure 9. Habitats at Hutton Lake NWR, Wyoming.

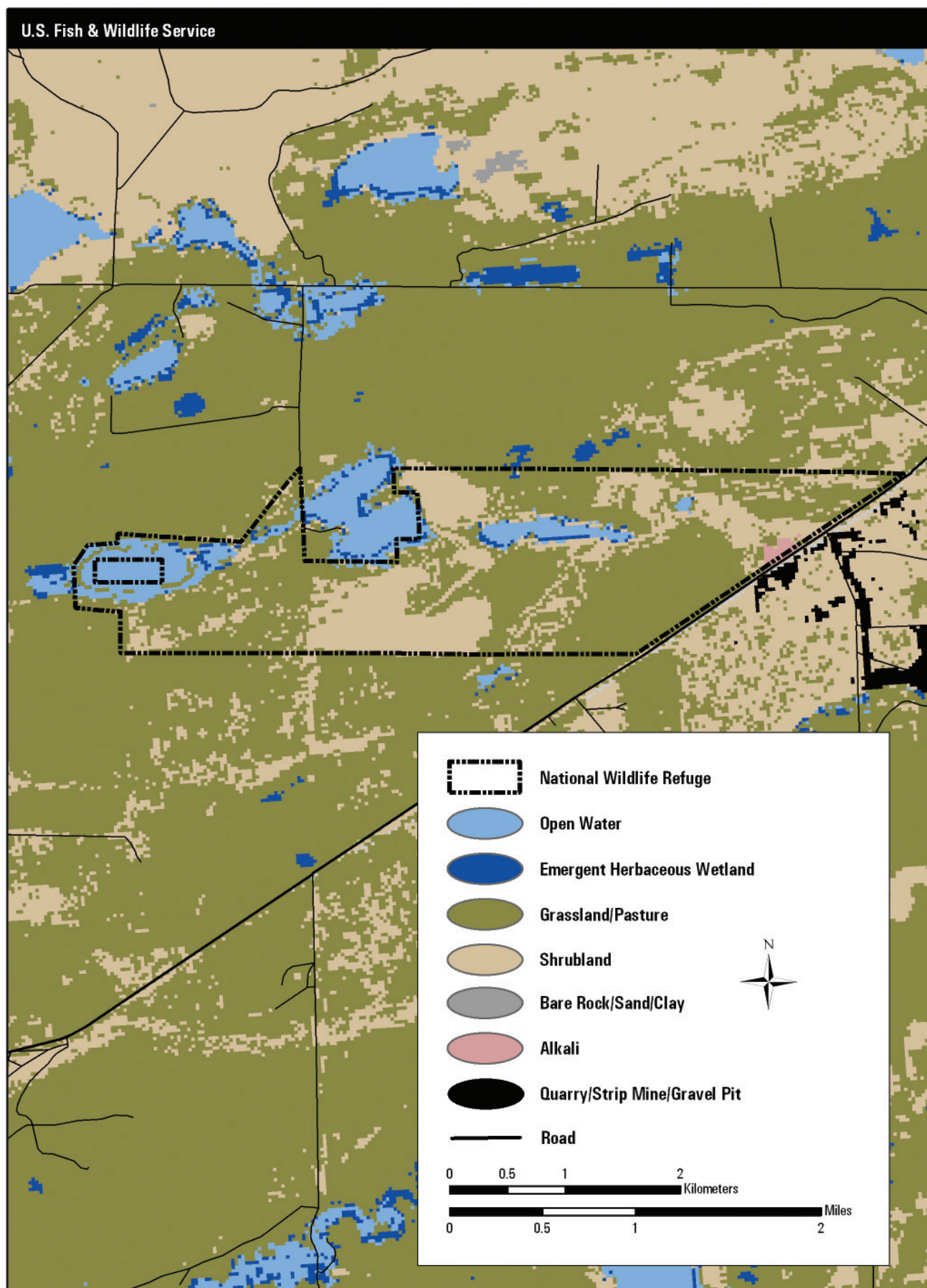


Figure 10. Habitats at Mortenson Lake NWR, Wyoming.



## Wetlands of Bamforth NWR

Records indicate Bamforth NWR has received little to no active wetlands management since its establishment in 1932. Bamforth NWR is located in a 4,000-acre natural depression known as the Big Basin northwest of Laramie. The bottom of the basin is dominated by alkali flats, small ponds, and Bamforth Lake, which encompasses approximately 250 acres when full. Bamforth Lake is owned mostly by the state of Wyoming with approximately 100 acres of the 550-acre lake located in the refuge boundary. The lake comprises half of the refuge, while the other half is upland habitat.

The Park ditch flows through the southwest portion of the refuge, and the Alsop ditch No. 1 flows along the northwest portion of the Big Basin. The refuge owns very junior irrigation water rights out of the Park ditch only, but water use in both ditches potentially influences refuge wetlands through irrigation return flows and subsurface water effects. Two small dikes are located on refuge lands—one is a stock watering pond, and the other is used for stock and irrigation storage, with most of the storage area located off refuge property. The ponds in the bottom of the basin are natural, with no inlet or outlet structures, resulting in little to no management capabilities. The soils along the bottom of the basin, including the ponds when dry, are strongly saline, resulting in minimal emergent or submergent vegetative growth. An island in Bamforth Lake, but not on refuge property, is used by white pelicans, double-crested cormorants, and California gulls for nesting. The area is also used by American avocets and killdeer, and occasionally by other migrating shorebirds and waterfowl.

Remaining refuge habitats include greasewood-dominated upland, alkali flats, and a limited amount of grassland. Before 1950, Bamforth Lake was an important area for many wildlife species due to a fairly dependable water supply. With the full development of the Wheatland Irrigation District, however, Bamforth Lake lost its major water supply due to junior refuge water rights (USFWS 1980). The loss of water for the refuge diminished the ability of the refuge to support migratory bird species from the mid-1950s to present day.

## Wetlands of Hutton Lake NWR

Hutton Lake NWR consists of five impoundments and surrounding uplands immediately adjacent to the floodplain of the Laramie River southwest of Laramie. Originally, there were likely only three separate basins—what is now Creighton Lake, Lake George, and Hutton Lake. Dikes were constructed to create Rush and Hoge lakes, and along the west boundary of the refuge, in an apparent attempt to keep water from reaching the floodplain to the west. A diversion structure was also placed in Sand Creek

to move appropriated water from the creek to the refuge, and ditches were dug to connect Rush and Creighton lakes and Lake George for easier water movement between them.

Creighton Lake (210 surface acres or 2,525 acre-feet) and Hutton Lake (221 surface acres or 1,135 acre-feet) are large and fairly deep open water areas with no water management capabilities once water reaches them. They typically fluctuate between various water levels based on yearly water availability and evaporation, rarely being completely full or dry. The fluctuating water levels prevent the establishment of emergent vegetation on these two wetlands by either drying up or flooding out any plants that might try to take hold.

Lake George, a smaller natural basin (16 surface acres or 250 acre-feet), receives water more often and more reliably than the larger pools. It maintains a water level stable enough for the establishment of a hardstem bulrush ring that completely encircles the lake.

Rush and Hoge lakes are larger than Lake George, but shallower and smaller than Hutton and Creighton lakes. Rush Lake (95 surface acres or 250 acre-feet) is the first in the system to receive water, so it generally benefits from available water from Sand Creek. It is also the shallowest pool and tends to dry up the quickest when water ceases to be available for recharge. Over 50 percent of Rush lake is emergent vegetation—hardstem bulrush and cattail—with numerous smaller areas of open water, and historic ditches through the lake to aid water movement to Hoge Lake and Lake George. Hoge Lake (75 surface acres or 200 acre-feet) has open water through its middle with significant stands of hardstem bulrush along the dike between it and Rush Lake and in the bay on its south side. Submergent vegetation is found in all pools but not in large amounts.

Creighton and Hutton lakes are important resting areas for waterfowl in the spring and fall, as rafts of redheads, scaup, canvasback, and coots numbering in the thousands are not uncommon. Canada geese use these lakes as molting areas in the summer. George Lake and Hoge and Rush lakes provide nesting habitat for coots, ruddy ducks, blackbirds, marsh wrens, pied-billed grebes, and soras, as well as feeding habitat for coots and dabbling ducks. Rush Lake also provides nesting habitat for white-faced ibis and black-crowned night-herons. Water levels are generally low enough on Creighton and Hutton lakes to allow nesting by American avocets and killdeer, but the lakes can potentially flood in high-water years.

During the summers of 2004 and 2005, California gull and double-crested cormorant rookery were established along the north shore of Hutton Lake. This previously unobserved activity occurred below

the high waterline of the lake, and it is unknown whether nesting would occur under high water conditions.

From the time of its settlement to current day, the lack of good water rights for Hutton Lake NWR has been a constant theme. In the semiarid Laramie Basin, water is a key resource in managing habitat for the benefit of migratory bird species. Because the Service does not own senior water rights, refuge wetlands water levels are dependent on natural processes and the willingness of adjoining landowners holding watering rights in Sand Creek to share their rights.

Records from the 1970s indicate low water availability and difficulty in providing water to refuge wetlands due to minimal water rights for the refuge. This trend of low water is prevalent through the 1970s until 1979 and 1980, which were reportedly good water years. By 1981 water conditions were again reported as poor.

Since the 1980s, water control structures at the refuge have remained in place with no manipulation of the boards or screw gates to actively manage water levels (Pam Johnson, wildlife biologist, Arapaho NWR; personal communication, January 2007). Water levels must be high in Rush and Hoge lakes and Lake George before water can move to the other wetlands. A water diversion structure on Sand Creek is opened or closed as needed by the Wyoming water commissioner. From Rush Lake water can flow to Lake George or Hoge Lake, or both. Lake George connects to the largest lake (Creighton

Lake), and Hoge Lake connects to Hutton Lake (see figures 6 and 12).

## Wetlands of Mortenson Lake NWR

Mortenson Lake NWR wetlands consist of four lakes positioned in a west to east line sharing what can be a common water source, an alkali playa, and an irrigation-dependent impoundment known as Harmon Reservoir. The current string of lakes was likely three playas prior to settlement. Springs to the south and west of the area, if natural, may have sustained water in Mortenson Lake proper, but it is unknown whether they are natural or induced from human activities. Mortenson Lake is the western-most lake followed by Garber Lake, Soda Lake, and Gibbs Lake. Meeboer Lake, which lies between Garber and Soda lakes, is owned by the Wyoming Game and Fish Department.

Mortenson Lake receives water from springs to the west and south, as well as irrigation return flows from waters out of the Pioneer ditch. The lake is mostly open water, with cattail and hardstem bulrush patches around the edges and extensive amounts of rushes and sedges along the north, west, and south shores. Prior to refuge acquisition, Mortenson Lake was used for irrigation of nearby lands and was typically at least partially drawn down in the summer.

Garber Lake is a small, mostly open water area immediately east of Mortenson Lake. Waters from Mortenson Lake are picked up in the Osterman ditch and feed into Garber Lake. An outlet on the lake's northeast corner allows water to flow out of Garber Lake and back into the Osterman ditch. Sedges and rushes border Garber Lake along with some hardstem bulrush.

Soda Lake, a long, narrow lake just east of the Meeboer Lake State Wildlife Area, receives water either from Meeboer Lake or from the South ditch, which comes in from the northwest. Both of these water sources can use and regularly do use water that has come through Mortenson Lake. Soda Lake is situated between steeper terrain on the north and south, resulting in little emergent vegetation along its shores, small areas of hardstem bulrush, and some rushes and sedges.

Gibbs Lake is a small, shallow area that is prone to drying out. When dry it is very alkaline. Water can be moved to Gibbs Lake from the South ditch. There is little vegetation along this pool except for rushes and sedges at the extreme high waterline.

The playa is a small, low spot southeast of Gibbs Lake, which is split by Highway 230. There is no water source for this pond, and it is usually dry with an alkaline surface.

Harmon Reservoir is south of Soda Lake and consists of a fairly large dike crossing the natural



*American wigeon.*

Donna Dewhurst/USFWS



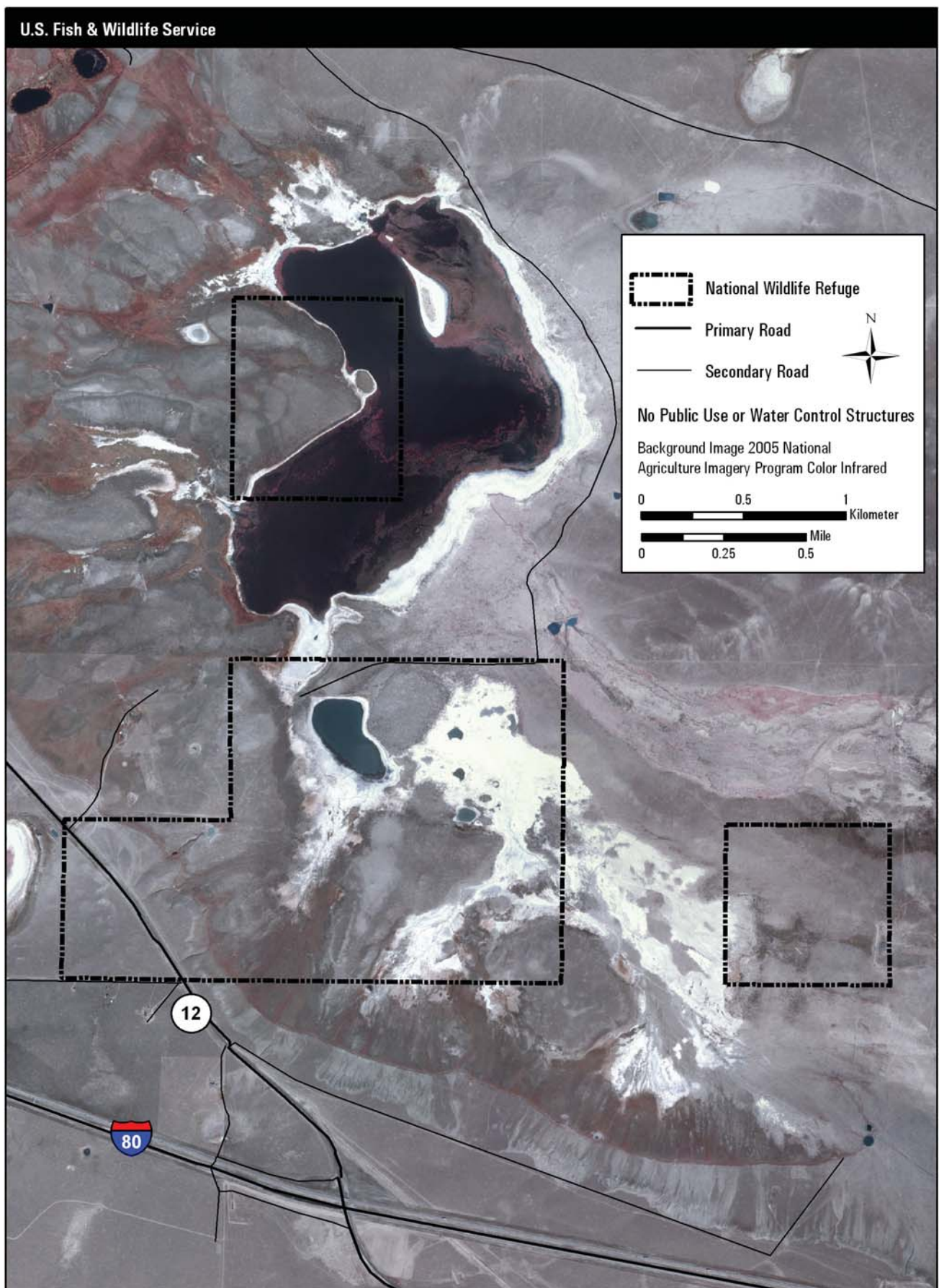


Figure 11. Infrastructure at Bamforth NWR, Wyoming.

drainage and a small outlet pipe that was historically used to supply ditches that ran on either side of the drainage for flood irrigation. Low priority limits the ability to use a water right due to holders of higher-priority rights using available water flows in all but wet years. Consequently, this area sees water so rarely that most of the vegetation in the bottom and along shorelines is more typical of surrounding uplands habitat than wetlands.

Submergent vegetation is present in Mortenson, Garber, and Soda lakes but not in large quantities, probably due to the saline conditions of the substrate.

The endangered Wyoming toad is found along the shores of Mortenson Lake and occasionally around Garber Lake, along with boreal chorus frogs. Significant numbers of redheads, lesser scaup, canvasback, and bufflehead are seen during migration (June–July and September) on Mortenson, Garber, and Soda lakes. Various dabbling ducks, coots, eared and pied-billed grebes, Canada geese, and black and Forster's terns are regularly observed on these lakes in the summer. American avocets, killdeer, and dabblers use Gibbs Lake.

Established for the endangered Wyoming toad, and managed in conjunction with recommendations from the Wyoming Toad Recovery Team, the area around Mortenson Lake proper has received active management (grazing, rest, prescribed fire) for the benefit of the Wyoming toad.

In 1992, a cooperative agreement with an adjacent landowner was established regarding the exchange of water shares for grazing privileges. This agreement remains in effect, with refuge staff directing grazing on the refuge to benefit the Wyoming toad and receiving water for refuge purposes. Water management activities are performed by the grazing permittee and generally consist of opening the south ditch headgate, which allows water to flow into refuge wetlands from approximately May 1 to September 11. As a result, the refuge receives an average of 232 acre-feet of water per year. The majority of the water is used to fill wetlands on the eastern section of the refuge.

### **Water Management History of Mortenson Lake NWR**

The prior landowner who purchased Mortenson Lake and surrounding land in 1972–73 would typically begin drawing down Mortenson Lake in May for irrigation and continue to draw it down until about July 1, when the area would be dried out for haying. It was not uncommon for the lake to refill by mid- to late August, when more irrigation would occur to moisturize the ground before winter. Water levels in the lake were held full throughout the summer when possible. In 1991, the Nature

Conservancy (TNC) purchased Mortenson Lake and surrounding land.

The Service purchased Mortenson Lake and surrounding area from TNC in May of 1993, creating what is now Mortenson Lake NWR. Sometime in the early 1990s, a water control structure was installed on the southern berm of the lake just off the dike, which raised the lake level. From 1993 through 2002, the water level in Mortenson Lake was held full from the spring through the fall. Boards were removed from the structure to slightly lower the water level each fall and reinstalled sometime in late March or early April. The reasons for lowering the lake level are twofold: (1) the high water levels through the winter are believed to negatively impact Wyoming toad hibernation, and (2) higher water levels can erode the dike, especially when ice melts.

Due to drought conditions, lake levels in 2003 and 2004 were not as full as in the past. In 2005, water levels were intentionally dropped starting in May and continuing through June to mimic historic water management. Overall, the lake water level was dropped a little over 1 foot. In the fall of 2005, the lake level did not return to full as it had historically due to a dry year. In 2006, a managed drawdown was accomplished, with lake levels returning to normal by fall.

### **Upland Habitat: Brush and Grasslands**

Uplands consisting of brush and grasslands is the dominant habitat type in the Laramie Basin, encompassing most of the lands not within an existing floodplain and below the mountains. Where access to water exists or has existed, some of these upland areas are in hay production, and the influence of past attempts at haying are still apparent from the existing vegetation. The uplands on the three Laramie Plains refuges are very similar, though subtle differences exist among them. Most of the soils in the uplands have alluvial origins, and many are influenced locally by differing water regimes that affect vegetation. In general, these lands appear to be unbroken, and given the undulating or sloped conditions of many sites, thoughts of seeding in the past were likely dismissed.

### **Uplands of Bamforth NWR**

Uplands range from the top of the bench forming the Big Basin through an area intermittently irrigated by the Park ditch to poorer soils abutting alkali flats or alkaline ponds. The vegetation on the bench is sparse grasses including western wheatgrass, needleandthread, and bluegrass, as well as some rabbitbrush and sagebrush. The area influenced by irrigation is more grass dominated with less bare ground; grasses are assumed to include western



and bluebunch wheatgrass and possibly introduced forage-producing species. The area closer to the alkaline sites can be quite barren, with 80–90 percent bare ground and only greasewood or black sage for vegetative cover, although certain spots include saltgrass in the mix.

### **Uplands of Hutton Lake NWR**

Uplands range from the shorelines of Hutton and Creighton lakes up to the highest benches, approximately 100 feet above the lakes. Soil characteristics result in some vegetative variability. The relatively flat area between the lakes is dominated by a large prairie dog town. This area is sparsely vegetated, with few grasses, several types of annual weeds and forbs, prickly pear, and greasewood on the south. In general, the southern uplands are more grass dominated and the north holds a little more greasewood, but openings in the brush and greasewood plants can be found throughout the refuge. The greasewood plants are especially thick and tall (4–5 feet) northeast of Creighton Lake, east of Hutton Lake, and along the spoil piles northeast of Hoge and Rush lakes. An area in the southwest corner of the refuge has been irrigated in the past and holds a thicker, more grass dominated regime than the rest of the refuge uplands. Vegetative species include western and bluebunch wheatgrass, needle and thread, and rabbitbrush.

### **Uplands of Mortenson Lake NWR**

The south half of Mortenson Lake NWR consists of a terrace of gravelly soils with a mound-intermountain pattern of microrelief. This terrace slopes down to the lakes of the refuge to the north, where between the pools and waterways feeding them, more gravelly, well-drained upland soils exist. Vegetation on the terraces is dominated by needleandthread, western and bluebunch wheatgrass, larkspur, and rabbitbrush. On the uplands not associated with the terraces vegetation consists of mostly the same species but also includes greasewood and more open ground. The slopes contain most of the same species but also includes sparsely spaced big sagebrush plants.

Characteristic wildlife of the Laramie Plains uplands habitat includes pronghorn, horned larks, and meadow larks. White-tailed prairie dogs are common on Mortenson Lake NWR and Hutton Lake NWR.

### **Grazing Management History at Bamforth NWR**

Grazing has occurred on Bamforth for at least the past 35 years, most recently in cooperation with an adjoining landowner. Lack of fencing limits the ability to adequately manage grazing, but it

is assumed that the current grazing regime is not detrimental to the area, based on observations of similar grazing regimes used on refuges in the region. Future monitoring and evaluation will ensure that grazing management is appropriate and compatible.

### **Grazing Management History at Hutton Lake NWR**

Grazing has occurred on Hutton Lake NWR for over 10 years. Records on grazing management for the refuge prior to 1997 were lost in an office fire. From 1998 to 2008, grazing will have occurred 7 out of 10 years. Grazing has been conducted from mid-May through mid-July for periods ranging from 10 to 18 days, with 200–418 cow/calf pairs using 98–296 AUMs. No grazing occurred in 2006 or 2007, and another year of rest is planned for 2008. Future monitoring and evaluation will occur to ensure that grazing management is appropriate and compatible. Future grazing will focus on fall grazing to remove heavy, decadent vegetation from ponds and to reduce wildlife disturbance during the nesting period of April–July.

### **Grazing Management History at Mortenson Lake NWR**

The landowner who purchased Mortenson Lake and the surrounding land in 1972–73 would typically put cattle on the middle pasture known as the Meeboer pasture (south and east of Meeboer Lake) in March or April, usually feeding the cattle until new growth started. The cattle were not brought onto the Mortenson Lake pasture until the tall larkspur, which grows along the hillside south of the lake, had stopped flowering and was no longer poisonous to cattle.

After the first of July, 200–225 pair of cattle were brought to the pasture and grazed for most of the summer. At that time, a much larger area was available for grazing, as the pasture included the area immediately north of the refuge boundary fence, just north of Mortenson Lake. This fairly well-irrigated north portion of the historic pasture is still in private ownership, producing good forage now and in the past. Consequently, it has seen a lot of use by the cattle, which has also resulted in greater cattle use of the north shore of Mortenson Lake, as they come in from the north to water and graze and rest there.

The former landowner has stated that cattle use of the north shore is noticeably diminished now compared to in the past due in part to the boundary fence and easier grazing to the south and east of Mortenson Lake. Another reason is a change in vegetation; the area is now mostly comprised of rushes and Carex, making it less enticing to cattle.

During the period when TNC owned Mortenson Lake and the surrounding land (1991–93), grazing was discontinued. Reintroduced by the Service, grazing at Mortenson Lake NWR under Service management has changed over the years. For the first two years (1993–94), cattle were allowed to graze the whole pasture encompassing Mortenson Lake. In 1994, an electric fence was constructed in the field to protect the outlet portion of the lake, which was thought to be prime Wyoming toad habitat. The fence was also used to concentrate the cattle in the more alkali/bulrush vegetation surrounding the north side of the lake to thin the vegetation for the toads. The electric fence was maintained over the next six years, with cattle using annually in the fall 28–90 AUMs around the shore of Mortenson Lake and 180–340 AUMs in the rest of the field.

In 2000, the fence was modified to eliminate cattle access to the dike because of erosion issues. Each fall through 2003, cattle used 32–72 AUMs along the lakeshore and 52–340 AUMs in the rest of the field.

In the fall of 2003, the planned 2004 grazing regime was changed on the advice of the Wyoming Toad Recovery Team. Shoreline vegetation had become too dense, and the open habitats documented as needed by the Wyoming toad (Withers 1992) were no longer available. The density of the vegetation had also potentially decreased temperatures in historic breeding areas, making them less suitable for the toad. Although Withers (1992) had documented breeding on the northeast and southeast shores of Mortenson Lake, during 2001 and 2002 egg laying had only occurred on the northwest shore in areas with adjacent open vegetation, and in 2002 tadpoles had been found only on grazed lands adjacent to the northwest shore of Mortenson Lake.

In 2004, the following change to grazing was made based on the recommendations of the previous landowner whom the Service had contacted to discuss historic land use practices. The electric fence was installed and cattle were allowed to access the shore of Mortenson Lake from July 13 through September 1, using 102 AUMs. The cattle were then moved to the main pasture from September 9 through October 26, using 108 AUMs.

The electric fence was not installed in 2005, and cattle grazed in the fall from October through November, using 255 AUMs. This grazing occurred after a prescribed fire of 22 acres was conducted on the north side of the lake in the spring, which was an attempt to remove the heavy rush and *Carex* vegetation along the north shore of the lake, as cattle grazing was not having the desired effect of reducing this vegetation.

In 2006, cattle were again allowed to graze the entire pasture (no electric fence) in July, using 94

AUMs. The cattle were removed in late July and then allowed back in the field in October, using another 58 AUMs.

## Alkali Flats

Alkali flats are predominately flat lands and seasonally dried-up wetland basins with strongly saline soils. These areas are associated with or adjacent to playas or intermittent lakes. The alkaline/saline soils appear to severely restrict plant growth, as vegetation is very spotty throughout much of this area. Vegetation includes salt grass, alkali sacaton, and greasewood. Wildlife use of the alkali flats is generally limited to migratory shorebirds, mostly killdeer and American avocet (likely in association with water nearby).

### Alkali Flats of Bamforth NWR

Approximately one-third to one-half of Bamforth NWR is alkali flats, depending on water levels.

### Alkali Flats of Hutton Lake NWR

A small playa northeast of Creighton Lake on Hutton Lake NWR may be described as alkali flats.

### Alkali Flats of Mortenson Lake NWR

Mortenson Lake NWR has one alkaline playa, and Gibbs Lake, when drawn down, becomes alkaline.

## Irrigated Meadows

Irrigated meadows are found only in a small area on the west portion of Hutton Lake NWR and in a few scattered locations on Mortenson Lake NWR. These areas are characterized by the presence of hydric soils and plants, and no distinction has been made as to whether they are naturally occurring or a manufactured condition because the total area of land involved is minimal. Characteristic vegetation may include creeping meadow foxtail, and other species introduced for hay production, as well as Baltic rush, Nebraska sedge, cattail, and hardstem bulrush. Wildlife use include sora, Wilson's phalarope, yellow-headed blackbird, red-winged blackbird, white-faced ibis, waterfowl (dabblers), and marsh wrens.

### Irrigated Meadows of Hutton Lake NWR

The meadows on Hutton Lake NWR are within the floodplain of Sand Creek and likely were historically flooded seasonally during runoff. The diversion structure on Sand Creek that brings water into the refuge is in this area. When the structure is open or if the neighbor is irrigating the adjacent ground, this area is flooded—sometimes for extended periods—depending on water availability.



### Irrigated Meadows of Mortenson Lake NWR

Mortenson Lake NWR meadows include subirrigated areas on the northwest and south side of Mortenson Lake, as well as irrigated lands between Mortenson and Meeboer lakes and between Soda and Gibbs lakes. As previously mentioned, it is conceivable but unknown as to whether these areas were naturally wet meadows prior to European settlement. If the springs that help feed Mortenson Lake waters are a historic part of the landscape, they could have helped keep Mortenson Lake full, and overflowing, which would have irrigated some of these lands. If these springs are the result of uphill irrigation, well development, or other constructions, the irrigated meadows are fairly recent to the landscape.

### Contaminant Assessment

Contaminant assessment for the Laramie Plains refuges are based on the results of baseline studies of environmental contaminants and land usage described below.

#### Contaminant Assessment for Bamforth NWR

A baseline study investigating trace elements in various media on the refuge was conducted from 1991 to 1993 (Dickerson and Ramirez 1993). Lead was slightly elevated in Bamforth Lake water samples (0.143–0.164 mg/l). Selenium was elevated in vegetation (3.28–4.26 ug/g) and sediment (28.6 ug/g). Selenium concentration in American avocet eggs ranged from 3.10 to 5.30 ug/g. Arsenic was slightly elevated in vegetation (24.5–49.2 ug/g) and aquatic invertebrates (23.1–33.1 ug/g), and boron was slightly elevated in vegetation (303 ug/g).

Cattle grazing and irrigated pasture lands are the primary use of the upland areas on the refuge. The possibility for spills to occur on or near the refuge is remote.

#### Contaminant Assessment for Hutton Lake NWR

A baseline study of environmental contaminants, primarily trace elements, was performed at Hutton Lake NWR in 1988 and 1989 (Ramirez and Armstrong 1992). Trace elements were not present in concentrations adverse to fish and wildlife. Aerial spraying for mosquito control is conducted on the private land located over 1 to 2 miles to the north. *Bacillus thuringiensis* (Bt) is applied on lands adjacent to the refuge for mosquito control. Grazing is the main use of this land.

Baseline sampling areas identified for Hutton Lake NWR include four of the five main lakes at the refuge: Hutton Lake, Rush Lake, Creighton Lake, and Lake George. Contaminants assessment process information should be reviewed in 5 years. Managers

should monitor mosquito-spraying activities to ensure that the refuge is not accidentally sprayed.

### Contaminant Assessment for Mortenson Lake NWR

A baseline study of environmental contaminants, primarily trace elements, was performed at Mortenson Lake NWR in 1988 and 1989 (Ramirez 1992). Trace elements were not present in concentrations adverse to fish and wildlife. Aerial spraying for mosquito control is conducted on the private lands in the basin and on lands adjacent to the refuge. Bt is also applied on lands adjacent to the refuge and used within the refuge for mosquito control. Grazing is the main use of this land.



USFWS

*A Wyoming toad in Mortenson Lake.*

Contaminants assessment process information should be reviewed in 5 years. Managers should monitor mosquito-spraying activities to ensure that the refuge is not accidentally sprayed.

A recent investigation (Dickerson, Hooper, Huang, and Allen 2003) assessed pesticide aerial drift from mosquito control activities on lands adjacent to the refuge. Pesticide indicator strips and spray cards were used to determine the extent of malathion entering the refuge and potential reintroduction sites. Aquatic invertebrate abundance was not significantly different ( $p < 0.05$ ) before and after spraying at any sites except the reference site and Meeboer Lake. No malathion residues were detected in the aquatic invertebrates. Results from this study indicated that, although some drift of malathion was occurring, the toads were not exposed to concentrations great enough to reduce adult survival, affect predator avoidance behavior, or reduce their food source.

Recent study results (Little, Calfee, and Dickerson 2002) show that ammonia nitrate is not currently elevated to concentrations that would adversely affect the Wyoming toad. Increases in nitrogen input, such as what might occur with changes in

land use, could increase the risk for adverse affects to the toad, particularly because ammonia nitrate concentrations may act synergistically with other environmental factors or may serve as a stressor for increasing the toads' susceptibility to disease. Periodical sampling of water from the refuge will ensure that nitrogen input does not increase to concentrations exceeding the tolerance level of Wyoming toads.

## Threatened and Endangered Species

Mortenson Lake NWR was established in 1993 to protect the Wyoming toad's last known population. The Wyoming toad was listed as an endangered species in 1984; the population at Mortenson Lake was discovered in 1987.

At the present time, no known threatened or endangered species use Bamforth NWR or Hutton Lake NWR. Hutton Lake NWR has been a site for Wyoming toad releases in the past. Refuge staff will continue to facilitate the use of Hutton Lake NWR as a release site for the Wyoming toad, per Recovery Team recommendation.

## Species of Concern

Table 3 indicates documented occurrences of vertebrate species of concern within the Laramie Plains refuges based on Keinath, Heidel, and Beauvais 2003; updated by service staff in 2008.

## CULTURAL RESOURCES

The Service is responsible for managing archaeological and historical sites found on refuge lands.

## Prehistory and Early Contact

Archaeological and architectural remains representing over 12,000 years of human occupation are potentially located on the Laramie Plains refuges. Little is known about the archaeology of the region because the land is mostly privately owned, and very few formal cultural resource surveys have been done in the area. Cultural resources in the surrounding regions span the earliest Paleo-Indian occupations to the Euro-American presence beginning in the early eighteenth century. Nearby sites are located in a variety of geographical settings and exhibit a wide range of artifacts and features, but definite trends in site types and changes through time are apparent.

Larson and Letts (2003) propose that although the record is thin, there was probably significant use of the area by indigenous peoples. Current

archaeological evidence indicates that the earliest inhabitants, the Paleo-Indians, migrated to the region near the close of the last Ice Age approximately 12,000 years ago. These people had a highly mobile lifestyle that depended on big-game hunting, including mammoths and the now-extinct huge bison. The hallmark of most Paleo-Indian sites are the distinctive spear points that are generally associated with animal kill and butchering sites, in addition to small temporary camps.

There was a gradual but definite shift in the pattern of human use of the region beginning about 9,000 years ago. The changes are due to a combination of regional climatic fluctuations and an increasing population, coupled with tremendous social change and technological innovation. Although this stage, referred to as the Archaic Period and lasting until about 2,000 years ago, is better represented in the archaeological record than the preceding Paleo-Indian stage, the interpretation of the remains is difficult. Evidence of a greater diversity of tools and increased use of a variety of plants and animals are found on many sites, and the occupation of rock shelters or pit houses becomes more common.

Approximately 1,500 years ago, the use of the bow and arrow marked the beginning of the Late Prehistoric Period. The increase in the number of known archaeological sites for this period may indicate a growing population or the influx of peoples from other regions, or it may just reflect our ability to locate these more recent sites. By the early 1800s, Euro-Americans were becoming more common in the area and evidence of their trade with the Native populations in horses, firearms, and ornamental items is increasingly evident in the archaeological record. Native American tribes including the Crow, the Cheyenne, the Sioux, and the Arapaho lost their lands with the Fort Laramie Treaty of 1868, and many were relocated to reservations outside the state.

Remains of these early occupations include fire hearths, lithic scatters (stone tools and the by-products from making them), quarry sites, and stone circles that are probably tipi rings. Fewer than 20 of these sites have been formally recorded in the Laramie Basin.

## Historic Period

As is the case with much of the West, the early exploration of the Laramie Basin owes much of its beginnings to the fur-trapping trade. In 1820, Jacques LaRame, the namesake of a county, city, river, mountain range, and basin, trapped along the river that now bares his name. Although thousands traveled through what is now Wyoming in the 1840s and 1850s along the nearby Oregon, California, and Mormon trails, most were heading farther west, and few people settled in what would become Wyoming. From 1862 to 1868 approximately 20,000 people a

**Table 3. Documented occurrences of vertebrate species of concern within the Laramie Plains refuges, Wyoming.**

## Bamforth NWR

<i>Species</i>	<i>Most Recent Observation</i>
American avocet	1996
American bittern	1911
American white pelican	2006
Black tern	unknown
Black-crowned night-heron	1996
Black-footed ferret	1977
Burrowing owl	1982
California gull	2006
Caspian tern	1996
Common loon	1933
Dwarf shrew	1987
Forster's tern	unknown
Herring gull	unknown
Iowa darter	unknown
Merlin	unknown
Mountain plover	1993
Northern leopard frog	1999
Snowy egret	1996
Swift fox	1988
White-faced ibis	1988

## Hutton Lake NWR

<i>Species</i>	<i>Most Recent Observation</i>
American avocet	2007
American bittern	1994
American dipper	1997
American white pelican	2007
Bald eagle	2004
Black tern	2007
Black-crowned night-heron	2007
Black-footed ferret	1964
Black-rosy finch	1992
Brewer's sparrow	2005
Burrowing owl	1991
California gull	2007
Chestnut-collared longspur	2005
Common goldeneye	2006
Common loon	1998
Ferruginous hawk	2005
Forster's tern	2007

## Hutton Lake NWR cont.

<i>Species</i>	<i>Most Recent Observation</i>
Golden eagle	2007
Hammond's flycatcher	1911
Long-billed curlew	2004
McCown's longspur	2005
Merlin	2004
Mountain plover	2005
Preble's meadow jumping mouse	2005
Sage thrasher	2007
Short-eared owl	1995
Snowy egret	2006
Swift fox	2002
Western jumping mouse	2005
Western scrub-jay	2002
White-faced ibis	2007
White-tailed prairie dog	2007
Wyoming toad	2000

## Mortenson Lake NWR

<i>Species</i>	<i>Most Recent Observation</i>
American avocet	2007
American white pelican	2007
Black-footed ferret	1964
Black tern	2007
Brewer's sparrow	2005
California gull	2007
Chestnut-collared longspur	1982
Common loon	1990
Long-billed curlew	2004
McCown's longspur	2005
Mountain plover	2005
Ringtail	1993
Sage sparrow	1982
Sage thrasher	2005
Sandhill crane	2005
Swift fox	1965
Tiger salamander	1989
White-faced ibis	2001
White-tailed prairie dog	2007
Wyoming toad	2007



year traveled along the Overland Trail, which ran approximately 3 miles north of Hutton Lake NWR. The stage stations established by the Overland Stage Company became the first permanent Euro-American structures in the area (Larson and Letts 2003).

The first homestead in the basin was built in 1864 by Phil Mandel along the Little Laramie River approximately 7 miles west of Bamforth NWR. It also served as a stage station for the Overland Trail. Mandel sold replacement stock to travelers and later cut and sold hay to soldiers at Fort Sanders, which was established in 1866 just south of present day Laramie and about 10 miles northeast of Hutton Lake NWR. Until 1882, when the fort closed, it served to help protect the early settlers and travelers in the basin during the many conflicts with the Native Americans.

The construction of the Union Pacific Railroad through the area in the late 1860s is one of the most influential events in the history of the region. The railroad lies about six miles east of Bamforth NWR and Hutton Lake NWR. The railroad facilitated better movement of both people and goods and led to the establishment of many towns along Wyoming's southern border. Laramie grew to be a major supply center, and numerous stations sprang up along the tracks. Access to the railroad was also a great catalyst for the growth of the cattle and sheep ranching industries.

Henry Bath built the Henry Bath Ranch and barn (also known as the Old Stone Ranch or Vallie Bath Ranch) in 1875 approximately 5 miles west of Bamforth NWR. These structures are listed on the National Register of Historic Places and are significant to the history of ranching and early Euro-American occupation in the Laramie Basin. Flag Ranch, another important ranch located about 3 miles east of Hutton Lake NWR, was settled in 1871 and became one of the early sheep operations in the region. Agriculture was also a major factor in the settlement of the area. By the late nineteenth

century, irrigation ditches were built to bring water to the fields. Several of these ditches still exist in the area of Hutton Lake NWR and Mortenson Lake NWR, and many are considered eligible for the National Register of Historic Places.

## Previous Cultural Resource Studies

With the exception of a small fence line survey in 2004, cultural resource inventories—as part of Section 106 compliance associated with the National Historic Preservation Act—have not been performed on the three refuges. However, archaeologists from the University of Wyoming surveyed 898 acres at Hutton Lake NWR (approximately half of the refuge) between 1992 and 1995 (Kornfeld 1996a, 1996b). Prehistoric features located included a quarry or lithic procurement site at the southwestern edge of the refuge and a hearth site with a fire-cracked rock concentration at the southern edge of Lake George. Historic archaeological remains consist of scattered trash dumps, troughs, fence lines, a possible corral, and historic structural remains. Individual artifacts include bottles and cans, some dating back to the 1870s and 1880s, with several others from the early 1900s.

## SPECIAL MANAGEMENT AREAS

This section describes the special management areas of the Laramie Plains refuges.

### Wilderness

Due to the small size of the refuges and current and past land use patterns, the refuges do not appear to meet the criteria for wilderness. As outlined in the Wilderness Act of 1994, a wilderness area

- generally appears to have been affected primarily by the forces of nature, with the human imprint substantially unnoticeable;
- offers outstanding opportunities for solitude or a primitive and unconfined type of recreation;
- has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition;
- may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

### Important Bird Area

The Laramie Plains refuges, particularly Hutton Lake NWR, are included in the Laramie Plains



USFWS

*Bird-watching opportunities exist at Hutton Lake NWR.*

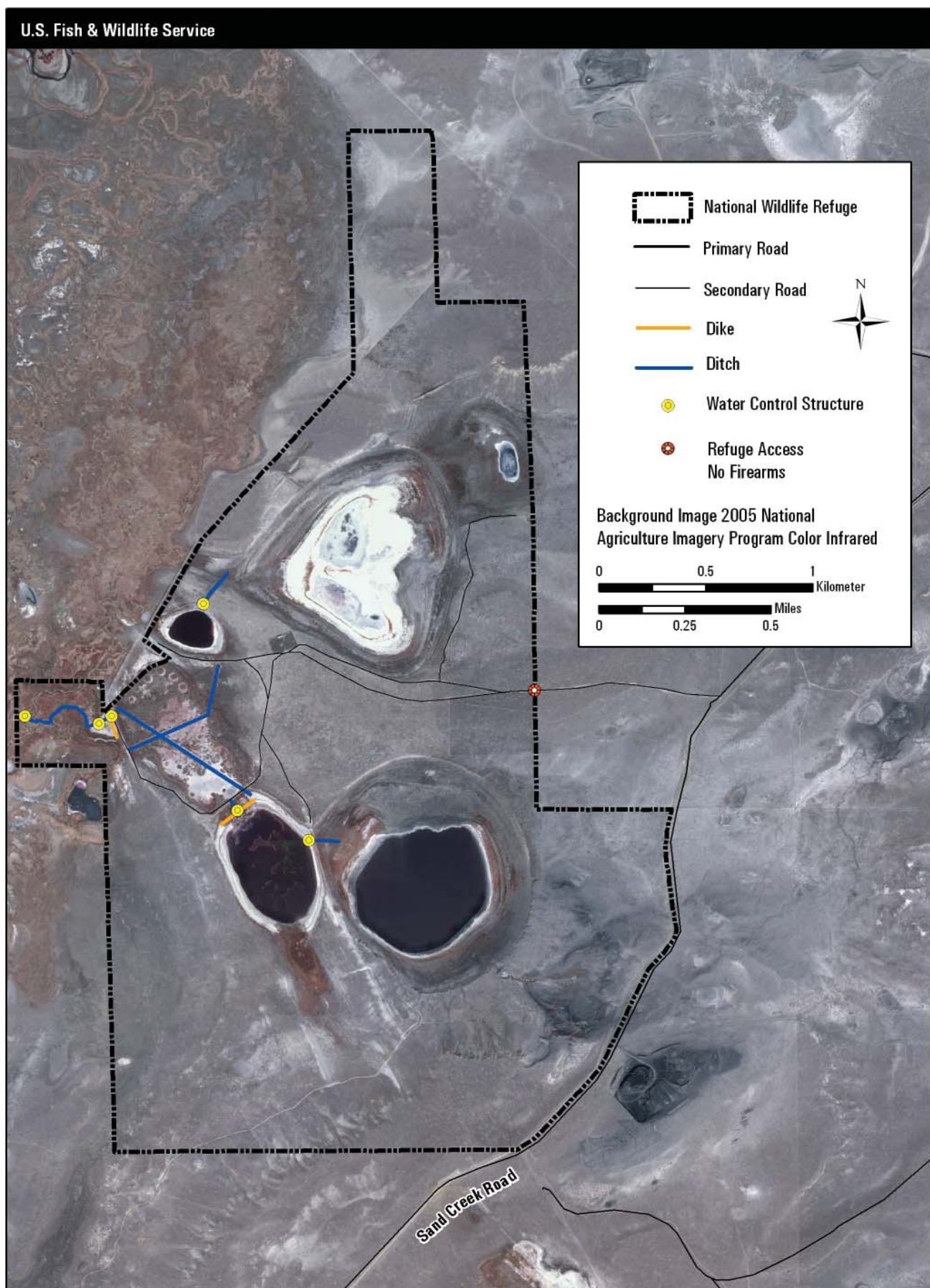


Figure 12. Infrastructure and public use areas at Hutton Lake NWR, Wyoming.



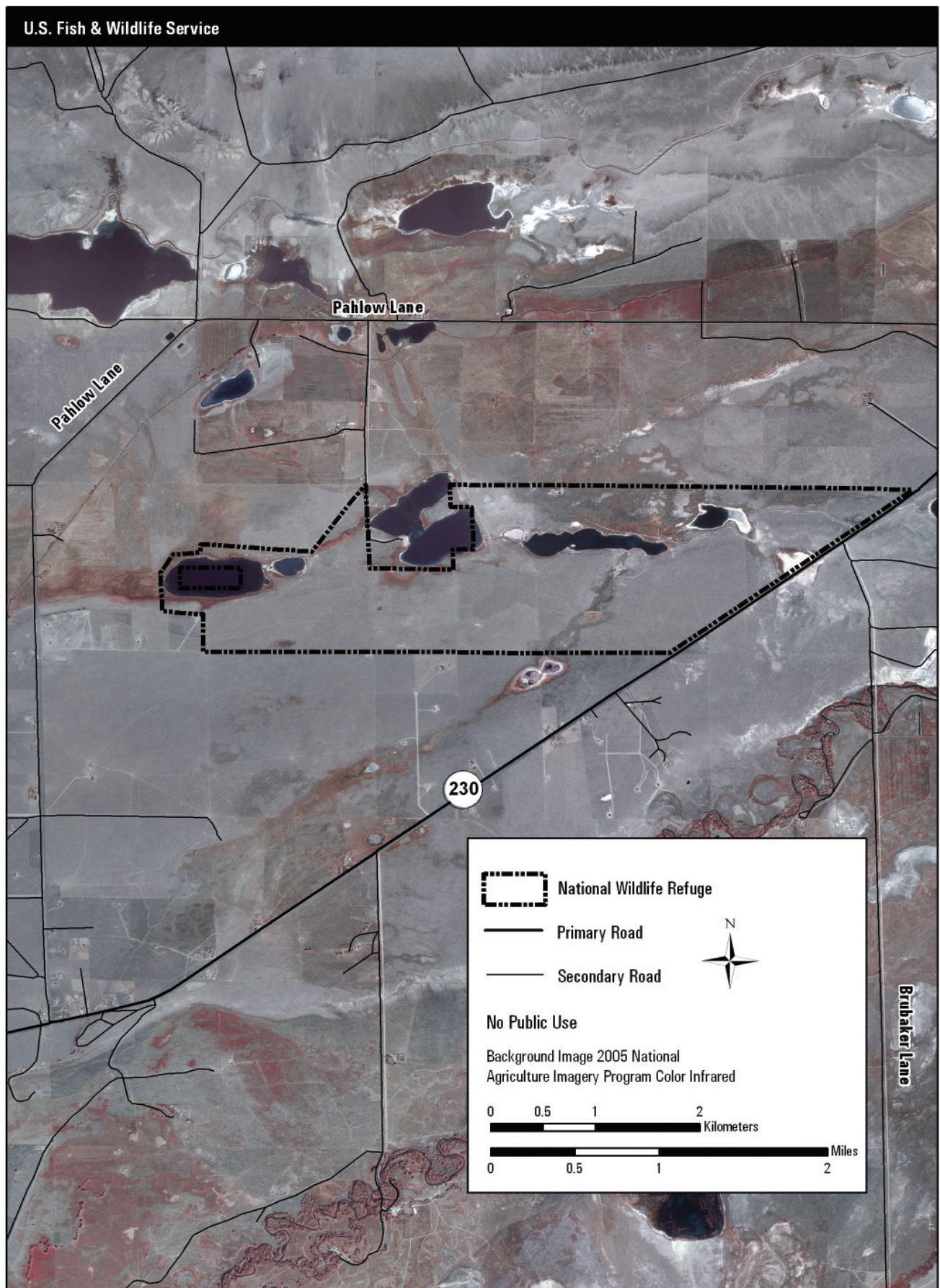


Figure 13. Infrastructure at Mortenson Lake NWR, Wyoming.



Lake Important Bird Area (IBA) recognized by the Audubon Society in partnership with Birdlife International. This designation was given to the Laramie Plains refuges in 2003 (Alison Lyon Holloran, conservation coordinator, Audubon Wyoming; personal communication, 2006). The refuges meet four of five criteria for establishment of an IBA including

- endangered/threatened species (Wyoming toad, Preble's meadow jumping mouse);
- other high conservation priority species (white-faced ibis, American white pelican);
- rare, unique, or representative habitat (high-prairie wetlands);
- significant concentration of waterfowl, gulls, and wading birds.

The only IBA criterion that is not currently met is long-term research.

## VISITOR SERVICES

Refuge infrastructure (roads, fences, water control structures) and public use facilities (parking areas, walking trails) are shown on the maps for Bamforth NWR (figure 11), Hutton Lake NWR (figure 12), and Mortenson Lake NWR (figure 13).

### Visitor Services at Bamforth NWR

No public use is allowed on Bamforth NWR. The refuge lands are separated into three parcels with private or state lands between them and have seen little active management in several decades. In addition, the soil types and moisture content in the area preclude adequate fence construction in some portions of the refuge. Consequently, much of the refuge boundary is unfenced and unsigned, creating potential trespass problems if visitation were allowed on the refuge.

One public road (Highway 12) traverses the southwest corner of the southwest parcel of the refuge, which offers distant views of area wetlands and other habitats on the refuge.

### Visitor Services at Hutton Lake NWR

Opportunities for four of the six priority public uses identified in the Improvement Act are available at Hutton Lake NWR.

#### Hunting

Many hunting opportunities exist in nearby areas, and Hutton Lake NWR provides a place for members of the nonhunting public to experience safe, nonconsumptive wildlife-dependent recreation during hunting seasons.

Due to the small size of the refuge and existing hunting opportunities in the area, the refuge will remain closed to hunting.

#### Fishing

Fishing is not permitted on Hutton Lake NWR. Unreliable water supplies with diminishing water quality over time in refuge impoundments precludes establishment of a viable fishery.

#### Wildlife Observation and Wildlife Photography

There are no formal opportunities for these activities, but opportunistic means are available. Although there is not a designated auto tour route on the refuge, 2.75 miles of gravel road are currently open to public travel (see figure 12). These roads allow visitors to traverse all major habitat types on the refuge, including uplands with prairie dog towns, grasses and shrubs used by pronghorn and sage thrashers, and refuge impoundments hosting a variety of water dependent birds. Facilities that would aid the public in conducting wildlife observation and photography such as photo blinds, observation blinds, and interpretive panels do not exist at the refuge.

#### Interpretation and Environmental Education

As previously mentioned, interpretive panels, tour routes, nature trails, or other interpretive facilities do not exist at the refuge. Staff are only occasionally on site, as there is not a visitor center on the refuge. An undated general information pamphlet and a 1972 bird list are available and sent to interested parties who contact the refuge staff located at Arapaho NWR with a request. Occasional requests for tours and talks from scout groups, schools, and nonprofit organizations are addressed on a case-by-case basis; the refuge biologist generally handles these requests.

### Visitor Services at Mortenson Lake NWR

Because Mortenson Lake NWR was acquired for the express purpose of preserving the endangered



*Northern pintail.*





**Figure 14. Laramie Plains refuges in relation to nearby centers of economic influence.**

Sources: Nationatlas.gov and BBC Research & Consulting.

Wyoming toad, public use is currently not permitted on the refuge to prevent potential adverse impact on the toad. The refuge does not have any visitor services facilities such as interpretive panels, nature trails, and kiosks. Requests for refuge tours, studies, and other uses are addressed on a case-by-case basis.

## PARTNERSHIPS

Refuge staff work with the following partners to perform natural resource management at the Laramie Plains refuges:

- Wyoming Toad Recovery Team to achieve population recovery goals for the Wyoming toad.
- Albany County Weed and Pest to assist with management of invasive species on the refuges.
- Wyoming Audubon Society to develop nonconsumptive wildlife-dependent recreation opportunities at Hutton Lake NWR.
- Wyoming Audubon Society to conduct annual breeding bird surveys on Hutton Lake NWR.

## SOCIOECONOMIC ENVIRONMENT

The local and regional demographics (statistical data about the population) are described below for the communities in the four-county study area pertaining to the Laramie Plains refuges.

## Socioeconomic Conditions

The following section illustrates the current socioeconomic conditions found within the study area, which is comprised of Albany, Carbon, Platte, and Laramie counties. The Laramie Plains refuges are located within Albany County; however, the remaining three counties included in the study area are located in close proximity to the refuges and could be affected by refuge management decisions.

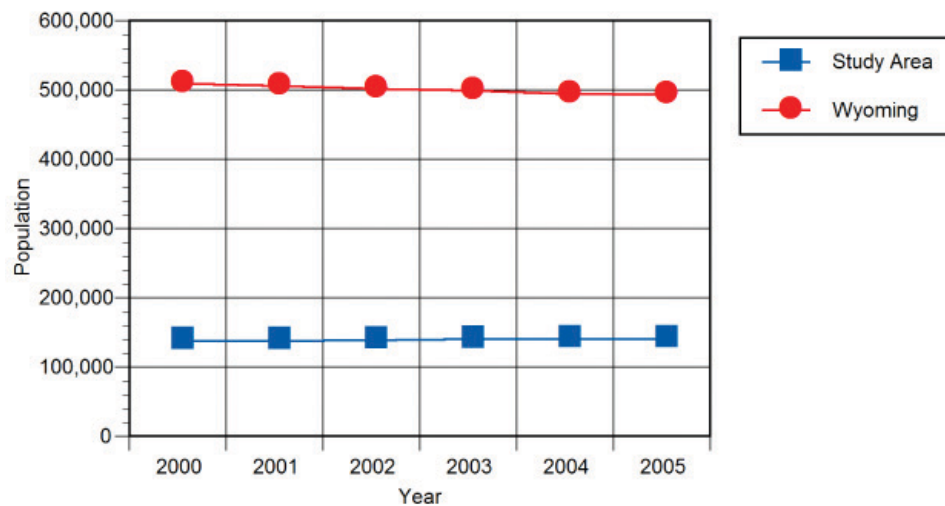
### Background

The Laramie Plains refuges encompass a total of 4,860 acres of open water, wetland, grassland, and sagebrush, the largest of which is the Hutton Lake NWR at 1,968 acres. Mortenson Lake NWR and Bamforth NWR are closed to public access, but Hutton Lake NWR provides the public with opportunities for wildlife viewing, photography, and environmental education. If the refuges attract visitors to the area, some economic benefit to local communities may result. Food, gas, and lodging purchases, spurred by visitation to the refuges, would provide local businesses with supplemental income and increase the local tax base. Management decisions affecting the Laramie Plains refuges may impact visitation levels, which in turn influences visitor spending in the local economy.

Figure 14 shows the location of the Laramie Plains refuges in relation to nearby centers of economic influence. The refuges are located in southeastern Wyoming near the cities of Laramie and Cheyenne.

### Population

The study area population has remained steady since 2000 and was approximately 140,000 in 2005. Over the same 5-year period, the population of Wyoming decreased by 15,500 residents (figure 15). The study area contained 27 percent of Wyoming's



**Figure 15. Wyoming and study area population.**

Source: State of Wyoming.

population as of 2005. Two of Wyoming's largest cities (Cheyenne and Laramie) are located within the study area and provide an ample tourist base for the refuges.

### Age

Figure 16 illustrates the aging population of the study area. In 2000, about 24 percent of study area population was under the age of 18; this age group is expected to constitute just 21 percent of the population by 2011. The median age of the study area was estimated at 36.02 years in 2006.

### Employment

The civilian workforce for the study area has increased by about 560 workers per year since 2000. In 2006, the study area labor force was about 69,177 workers. The unemployment rate for 2006 was estimated at 3.19 percent, which was slightly

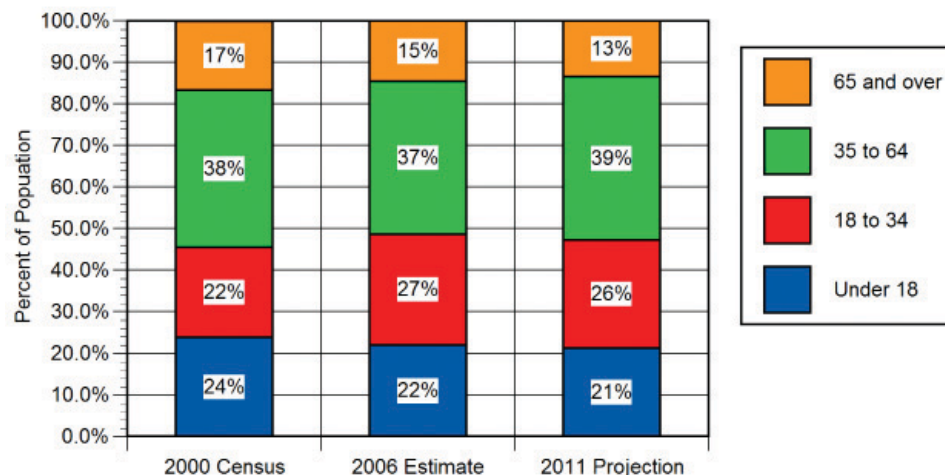
lower than the state's 3.5 percent unemployment rate. Both the study area and the state had a lower unemployment rate than the nation, which was 4.4 percent in October 2006 (U.S. Bureau of Labor Statistics, Employment Situation Summary, October 2006).

### Local Industry

Sales and office occupations are the largest employment sector at 30 percent (figure 17). Professional and related occupations employ 22 percent, while farming, fishing, and forestry occupations employ 1 percent of the labor force.

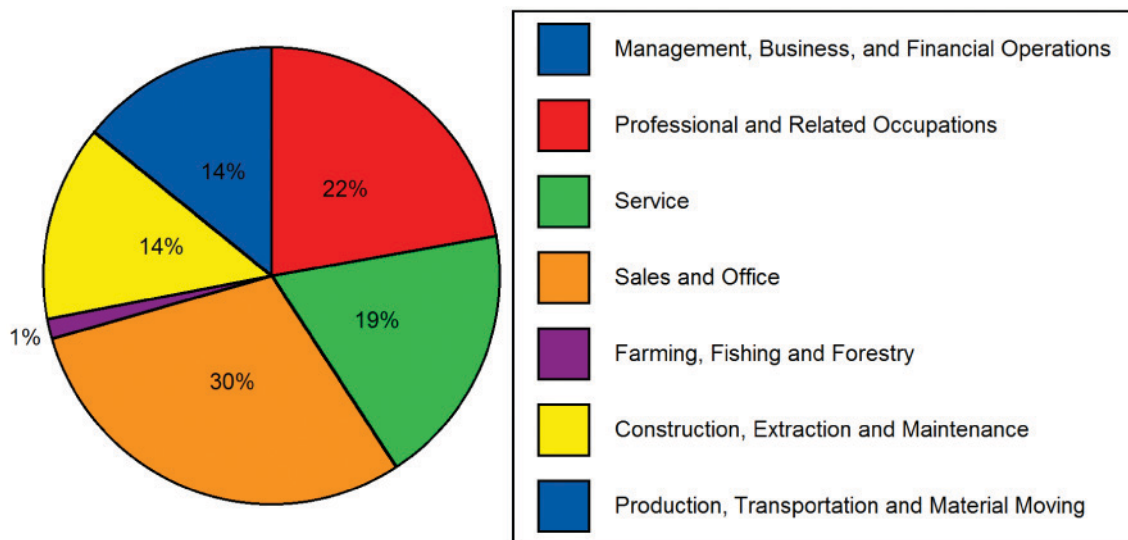
### Refuge Activities

Bamforth NWR and Mortenson Lake NWR are closed to public access. Hutton Lake is open for nonconsumptive wildlife-dependent



**Figure 16. Study area age composition.**

Source: U.S. Census Bureau (2006).



**Figure 17. Study area employment distribution, 2006.**

Source: PCensus (2006).

recreation, which includes wildlife observation, wildlife photography, environmental education, and interpretation. Hunting and fishing are not permitted.

### Visitation and Visitor Spending

Laramie is the primary center for visitation and potential use for all three Laramie Plains refuges. The city was home to 27,204 residents in 2000. With the University of Wyoming based in Laramie, requests for field trips, and field activities for university classes on the refuges (mainly Hutton Lake) are common. This academic base and urban population show interest in natural resources in various forms. Audubon Wyoming and the local Audubon chapter are based in Laramie.

The USDA Forest Service and Bureau of Land Management manage 674,479 acres of land in Albany County available for hunting, fishing, and camping, and several state wildlife areas also allow these public uses.

Hutton Lake NWR received only 2,000 visitors last year due to its small size and minimal marketing efforts. According to Ann Timberman (project leader, Arapaho NWR; personal communication, January 2007), the majority of these visitors likely reside in the local area. Without the addition of nonlocal visitors, increased economic activity in the area as a result of visitation to the Hutton Lake NWR is unlikely.

### Employment Estimates

The presence of the University of Wyoming in Laramie strongly influences Albany County's occupational demographics. The county ranks the highest in the state in the percentage of residents claiming management, professional, and related

occupations (including education) at 40.4 percent, compared to a statewide figure of 30.0 percent. The rest of the occupational breakdown for the county is as follows, with state figures in parentheses: 23.2 (24.2) percent in sales and office; 18.9 (16.7) percent in service; 8.5 (12.8) percent in production, transportation, and material moving; 7.6 (14.8) percent in construction, extraction, and maintenance; and 1.4 (1.5) percent in farming, fishing, and forestry. Of these occupations, 31.2 percent are government jobs (local, state, or federal), which includes university employees. This figure is again the highest in the state and well above the state average of 20.4 percent government workers.

According to the 2000 census (U.S. Census Bureau 2000), 91.3 percent of Albany County residents were white compared to 92.1 percent of Wyoming as a whole. Of the 32,104 residents in the county, 2,397 claimed Hispanic/Latino origin, putting this group at 7.5 percent of the county populace compared to 6.4 percent of the state populace. Other ethnicity information for the county includes 1.7 percent Asian, 1.1 percent Black or African American, 1.0 percent American Indian and Alaska Native, and 0.1 percent Native Hawaiian and other Pacific Islander; 2.6 percent claimed some other race, and 2.2 percent claimed two or more races.

### Education

Albany County surpasses the state of Wyoming in the percentage of the population 25 or older that have graduated from high school (93.5 percent verses 87.9 percent), and in residents who have earned a bachelor's degree or higher (44.1 percent verses 21.9 percent).

## REFUGE OPERATIONS

During the 1960s, the headquarters for the Laramie Plains refuges was located in the Wyoming Farm Bureau office in Laramie. The Arapaho NWR was established in 1967, and the headquarters for the Laramie Plains refuges was moved to Arapaho NWR near Walden, Colorado. Since that time, the Laramie Plains refuges have been managed as part of the Arapaho NWR Complex.

### Staffing

The Laramie Plains refuges are managed by Service staff headquartered at the Arapaho NWR. Below is a list of the current staff for Arapaho NWR Complex.

<i>Management</i>	Project leader, GS-12
	Refuge operations specialist, GS-11
<i>Biology</i>	Wildlife biologist, GS-9
<i>Administration</i>	Administrative assistant, GS-8
<i>Maintenance</i>	Maintenance worker, WG-8

### Facilities

Hutton Lake NWR facilities include a three-door equipment shed in a small enclosure and several other small storage buildings. Bamforth NWR and Mortenson Lake NWR do not have any facilities.



## 4 Management Direction

This chapter describes the management direction the Service designed—with public coordination—to achieve the vision for the Laramie Plains refuges as described in chapter 2. The chapter includes the following sections:

- management focus
- goals, objectives, strategies, and rationale
- staffing and funding
- step-down management plans
- monitoring and evaluation

The pages specified below contain the management direction designed to achieve the vision (chapter 2) for the Laramie Plains refuges. The shared direction for the three refuges is followed by individual plans for each refuges:

- The Laramie Plains Refuges, pages 46–47
- Bamforth NWR, pages 47–48
- Hutton Lake NWR, pages 48–52
- Mortenson Lake NWR, pages 52–54

### MANAGEMENT FOCUS

For the past 40 years, the Laramie Plains refuges have received little to no active management due to the relatively small staff of the Arapaho NWR Complex and competing refuge priorities. Bird surveys are conducted and boundary fences and signs are maintained, but little to no proactive management, monitoring, or other activities have occurred.

Using data and information from other wetland-complex areas, some biological goals have been established for these refuges. Future studies may indicate whether these goals are appropriate or need to be revised. It is hoped that this plan will demonstrate the need to actively manage these refuges for the benefit of migratory bird species. An increase of one FTE, dedicated to the Laramie Plains refuges and Pathfinder NWR (located 50 miles southwest of Casper, Wyoming), will have a noticeable impact on the ability to conduct site-specific research; build and maintain partnerships; develop specific biologically based, goal-oriented, step-down habitat management plans; and guide future management direction for these stations.

The planning team developed objectives in support of goals identified in chapter 2 to carry out the proposed action for management of the Laramie Plains refuges. Strategies to achieve objectives are suggested. Rationale is included that supports goals, objectives, and strategies. In addition, assumptions are discussed.

Biological goals and objectives emphasize management of plant communities as habitat for wildlife, especially migratory birds, and are organized by major habitat types represented at the three refuges. Goals and objectives are habitat based rather than wildlife based, because wildlife often respond to factors beyond the control of local refuge management (for example, disease outbreaks or habitat conditions on important staging or wintering sites can affect populations of migratory birds). Furthermore, management practices (for example, prescribed fire, grazing, and water-level manipulation) usually benefit plant communities rather than wildlife populations. Habitat-based objectives emphasize monitoring of important vegetation attributes such as community composition and vegetation structure over time. In most cases, wildlife population responses to habitat changes are not monitored. Rather, site-specific inventories, applied research, and literature reviews allow for reasonable predictions of wildlife response to habitat management.



*Black-crowned night-heron.*

Additional goals, objectives, and strategies are developed for visitor services, cultural resources, research and science, and refuge operations.

The National Wildlife Refuge System Administration Act of 1966 required the Secretary of the Interior, before permitting uses, to ensure that those uses are compatible with the purposes

of the refuge. The CCP process requires a compatibility determination for all existing and proposed refuge uses. Compatibility determinations for the Laramie Plains refuges include wildlife observation and wildlife photography (appendix J), environmental education and interpretation (appendix K), and prescribed grazing (appendix L).

## GOALS, OBJECTIVES, STRATEGIES, AND RATIONALE

### The Laramie Plains Refuges Management Direction

The following goals, objectives, and strategies apply to all three Laramie Plains refuges and outline the actions needed to achieve the vision of the refuges. The Service intends to meet these objectives during the next 15 years.

#### Research and Science Goal

Conduct natural resource management using sound science and applied research to advance the understanding of natural resource function.

##### Objective 1

Within 2 years, identify and prioritize biological monitoring needs to meet the refuges' goals and objectives. Expand research activities for habitat and wildlife to evaluate the effects of management activities on species diversity and habitat conditions. Conduct applied research to direct management decisions.

##### Strategies

- Identify and prioritize habitat management research needs.
- Conduct research in collaboration with others on priority needs.
- Encourage research that focuses on the refuges' habitat management goals.
- In cooperation with others, develop step-down management plans.
- Form partnerships with universities and other entities to conduct specific research to identify refuge resources and obtain a better understanding of the effects of management activities.

##### Rationale and Assumptions

The lack of active management has resulted in sparse biological information regarding these refuges. It will be important to prioritize and plan active and long-term research programs to gather biological data.



*Prairie dog.*

USFWS

##### Objective 2

Within 6 years, actively utilize research data to guide management decision making.

##### Strategies

- Initiate highest-priority studies to enable time to conduct studies and evaluate data.
- Reach out to partners and others to conduct research in highest-need areas.
- Apply for grants, Science Support Program funding, and other funding initiatives to fund applicable research.

##### Rationale and Assumptions

Research will focus on providing baseline data and achieving identified habitat goals. Projects will be evaluated and limited to those that will answer questions needed for improved refuge management. The scope and impacts of individual and cumulative research projects will be evaluated to ensure minimal disturbance to wildlife. Projects may be delayed or denied if wildlife or habitat impacts are determined to be too great.

#### Partnerships Goal

Work with partners to determine the wildlife and habitat resources on the refuges, to maximize wildlife habitat protection, and to increase understanding of wildlife needs, as well as the benefits wildlife offer to individuals and communities, on and off the refuges.

##### Objective 1

Throughout the life of this plan, promote existing partnerships and develop new partnerships to achieve refuge goals and objectives.

##### Strategies

- Engage in partnerships that result in collecting baseline data for the refuges.

- Work with partners to evaluate mineral holdings, and where applicable, gain mineral rights to protect surface habitats.
- Work with partners to evaluate water rights, and where applicable, gain additional water rights to benefit refuge management for migratory bird species.

### Rationale and Assumptions

Partnerships are important to the Service to achieve refuge management goals and objectives. If the Service does not cultivate partnerships, which take time and resources to develop and maintain, opportunities to work with others in conserving wildlife habitat will be missed.

Current partnerships include Albany County Weed and Pest, local landowners, and Wyoming Audubon. Efforts will be increased to focus research-based partnerships on collecting baseline data for the refuges.

## Cultural Resources Goal

Identify and evaluate the cultural resources on the refuges and protect those that are determined to be significant.

### Objective 1

Within the 15-year life of this plan, accomplish a complete cultural resource survey of those areas of the refuges with a moderate to high potential for cultural resources.

### Strategies

- Create a sensitivity model that identifies areas as having a low, medium, or high potential for cultural resources.
- Complete a cultural resource survey, including evaluations and management recommendations, for the moderate and high potential areas.

### Rationale and Assumptions

Survey is the best tool available to determine the location of cultural resources on the refuges. Through survey, both historic and prehistoric sites are identified and key information is gathered that promotes planning, research, and educational outreach. Although a few small surveys have been conducted, large-scale surveys are needed to better understand the distribution and nature of the resources. By concentrating on areas with a moderate or high potential for cultural resources, the Service can locate the greatest number of significant sites and work toward their protection and possible interpretation.

## Refuge Operations Goal

Secure and demonstrate the effective use of funding, staffing, and partnerships for the benefit of all resources in support of the refuges and the Refuge System.

### Objective 1

Within 2 years of plan approval, hire and assign to the Laramie Plains refuges and Pathfinder NWR one full-time Service employee to perform increased management activities on the refuge.

### Strategies

- Hire a refuge manager or refuge operations specialist and assign to the Laramie Plains refuges and Pathfinder NWR.
- Increase funding to improve management activities at the refuges.

### Rationale and Assumptions

The Laramie Plains refuges are administratively managed by the Arapaho NWR Complex. The complex includes Arapaho NWR, Bamforth NWR, Hutton Lake NWR, Mortenson Lake NWR, and Pathfinder NWR. The current staffing of the complex precludes a dedicated staff member for the three Laramie refuges, which has resulted in minimal management at these refuges.

The Laramie Plains refuges were managed by Service staff headquartered in Laramie until the Arapaho NWR was established in 1967, when headquarters and priorities shifted to Walden, Colorado. Since that time, management of the Wyoming refuges has been minimal.

Through discussions, the planning team determined that the addition of one full-time Service member assigned to the Laramie Plains refuges and Pathfinder NWR would provide adequate staff to actively manage the lands. Refuge management activities would be increased and enhanced, and refuge staff would strive to better understand the effects of management actions on the refuges. An emphasis on adaptive management, including monitoring the effects of habitat management practices and using research results to direct ongoing management, would be a priority.

## Bamforth NWR Management Direction

The following goals, objectives, and strategies for Bamforth NWR outline the actions needed to achieve the vision of the Laramie Plains refuges. The Service intends to meet these objectives during the next 15 years.



## Natural Resources Goal

Conduct baseline surveys to identify refuge resources and the role these resources serve in the Laramie Basin ecosystem and the Refuge System.

### Objective 1

Within 5 years, identify and prioritize biological monitoring needs and gather baseline data to evaluate refuge management needs. Conduct applied research to direct management decisions.

#### Strategies

- Identify and prioritize habitat management research needs.
- Conduct research in collaboration with others on priority needs.
- Encourage research that focuses on developing plans for the future of this refuge.
- In cooperation with others, evaluate the role Bamforth NWR plays in the Refuge System.

#### Rationale and Assumptions

The Laramie Plains refuges are primarily native grasslands. The decline of grassland nesting birds has been attributed to habitat loss and conversion, fragmentation, and the disruption of ecological factors, such as fire, which created a mosaic of habitat types across the landscape. As a result, many grassland bird species are now considered species of biological concern (USFWS 2002). Managing natural areas for these bird species involves providing the nesting habitat requirements and food resources essential for their reproduction and survival. These requirements include large, treeless patches containing within them diversity in vegetation structure.

Though these birds have been identified in the area, the Service has no data on the effects of current grazing, condition of uplands, or other biological information due to inactive management. The lack of site-specific biological information on these species' use of refuge lands and personnel dedicated to guide management practices (grazing, rest, prescribed fire) needs to be corrected by gathering data and evaluating such management practices for the benefits they offer to wildlife resources. Baseline information on vegetative structure, composition, and quality as well as water quality are imperative to guide proper management decisions.

### Objective 2

Within 6 years of hiring an FTE assigned to Arapaho NWR but responsible for managing the Laramie Plains refuges and the Pathfinder NWR, actively use research data to guide management decision making.

#### Strategies

- Initiate highest-priority studies to enable time to conduct studies and evaluate data.
- Reach out to partners and others to conduct research in highest-need areas.
- Apply for grants, Science Support Program funding, and other funding initiatives to fund applicable research.

#### Rationale and Assumptions

A lack of information is hampering management direction. Detailed step-down plans will be developed and implemented as information is gathered. Projects will be evaluated and limited to those that will effectively address the need for improved refuge management. The scope and impacts of individual and cumulative research projects will be evaluated to ensure minimal disturbance to wildlife. Projects may be delayed or denied if wildlife or habitat impacts are determined to be too great.

## Hutton Lake NWR Management Direction

The following goals, objectives, and strategies for Hutton Lake NWR outline the actions needed to achieve the vision of the Laramie Plains refuges. The Service intends to meet these objectives during the next 15 years.

### Wetlands Goal

Manage refuge impoundments and other wetlands to create diverse habitat for wetland-dependent wildlife.

#### Objective 1

Over a 5-year average, manage Rush Lake at approximately 60–80 percent emergent vegetation and 20–40 percent open water during the waterfowl breeding season (May–June) for the benefit of colonial nesting birds (white-faced ibis, black-crowned night-herons), as well as other emergent-dependent species (yellow-headed blackbirds, marsh wrens, ruddy ducks, Wilson's phalaropes).

#### Strategies

- Graze cattle to stimulate or maintain habitat conditions.
- Use prescribed fire to stimulate or maintain habitat conditions.
- Use mechanical manipulation (mow) to stimulate or maintain habitat conditions.



- Manipulate water (flood and drawdown) to stimulate or maintain habitat conditions.
- Develop vegetative monitoring protocol.

### Rationale and Assumptions

Previous research has indicated that wetlands with an approximate 50:50 ratio of open water and emergent vegetation (cattails, bulrushes), often termed “hemi-marshes,” attract the highest densities and diversities of wetland birds (Weller and Spatcher 1965). The Wyoming Partners in Flight, Wyoming Bird Conservation Plan (Nicholoff 2003) notes that depending on the situation, cover:water ratios of 65:35 to 35:65 might be considered optimum as well. A good interspersed of vegetation and open water is probably more important than the ratio of the two. Key species of concern on the refuge include white-faced ibis and other birds that require dense emergent cover. White-faced ibis require high amounts of emergent vegetation, such as bulrushes, in their breeding habitat (Dark-Smiley and Keinath 2003).

A habitat model for marsh wrens describes optimum conditions as occurring when there is >80 percent emergent cover (Gutzwiller and Anderson 1987). The emergent vegetation/open water objective for Rush Lake calls for 60–80 percent emergent vegetation to better provide for the habitat needs of the key birds of concern. Wilson’s phalarope will use both fresh and alkali wetlands with three characteristics: open water, emergent vegetation, and open shoreline (Dechant et al. 2003). Though Wilson’s phalarope have been observed, a lack of on-site data concerning water quality and other parameters hamper management actions. From the more freshwater Rush Lake to the more alkaline Creighton Lake, Hutton Lake NWR can provide life-cycle requirements for these bird species, but site-specific information is needed to guide management direction.

### Objective 2

Manage Hoge Lake and Lake George to have approximately 70–90 percent open water and 10–30



Wilson’s snipe.

percent emergent vegetation to benefit migratory birds (lesser scaup, gadwall, black tern) for migration habitat needs and brood rearing.

### Strategies

Same as objective 1.

### Rationale and Assumptions

From the Service’s 1975 “Annual Report” to current day, the lack of good water rights for Hutton Lake NWR and the inability to do more than just fill ponds when possible and watch them evaporate when conditions are dry are constant themes. In the semiarid Laramie Basin, water is a key resource. Because the Service does not own senior water rights, the refuge wetlands are at the mercy of nature and the generosity of adjoining landowners who hold the rights to the water in Sand Creek. Since the 1980s, the water control structures at Hutton Lake NWR have remained in place with no active water management other than the water commissioner opening or closing the headgate on Sand Creek. From Rush Lake water can flow to Lake George or Hoge Lake, or both. Lake George connects to the largest lake, Creighton Lake, and Hoge Lake connects to Hutton Lake. From Creighton Lake to Hutton Lake the area is a closed basin. The closed basin affects water quality, with Creighton Lake exhibiting some alkali characteristics such as white sediments ringing the dry lakeshore. For these reasons, Hutton Lake NWR is primarily an important resting area for migratory birds and a brood-rearing area of local importance.

A habitat model for lesser scaup notes that broods tend to use expansive areas of open water as security and escape cover, and highly suitable conditions are described as having large amounts of open water and as little as 0–50 percent emergent cover (Allen 1986).

During the postbreeding season, gadwalls are found with diving ducks in deeper water habitats; northern shovelers prefer more open permanent water bodies (Murkin et al. 1997). Ruddy ducks’ fall habitat use patterns show a preference for deeper, more open habitats, as they require large open areas to become airborne. Open lake marshes serve as roosting sites during migration for a wide range of species.

### Objective 3

Inspect impoundments annually for tamarisk and eradicate any plants found as part of the effort for a zero tolerance of this invasive species on the refuge.

### Strategies

- Improve and rehabilitate water control structures on all wetlands.

- Continue to partner with Albany County Weed and Pest for monitoring and control of invasive species.



*Open-water wetlands.*

### Rationale and Assumptions

Tamarisk, in low concentrations, has been found on all lakes on the refuge. Plants have been pulled or sprayed in cooperation with Albany County Weed and Pest. The county surveys the refuge and controls tamarisk annually, and found plants are either pulled or sprayed with herbicides.

Tamarisk effectively displaces native vegetation through competition for available resources and germination sites, offering little suitable habitat for native wildlife (Sudbrock 1993, Lovich 1996).

### Objective 4

Within 5 years, evaluate refuge water rights and investigate opportunities for acquiring more water rights. Initiate acquisition of additional water rights where feasible.

#### Strategy

- Work with USFWS region 6, division of water resources, to evaluate existing water rights, pursue additional water rights, and seek adjudication of existing storage rights.

### Rationale and Assumptions

Water rights on the refuge are limited. If water rights were available for purchase, refuge wetlands could be managed to increase the benefit to migratory bird species.

## Uplands Goal

Evaluate shrub- and grass-dominated uplands for the benefit of migratory birds (willet, horned lark, vesper sparrow), white-tailed prairie dogs, pronghorn, and other wildlife.

### Objective 1

Within 3 years, initiate baseline inventories to identify flora and fauna species composition and distribution, as well as habitat types and their distribution on the refuge. After initial evaluation, develop quantitative objectives and use potential tools (prescribed fire, grazing, rest, invasive species control) as appropriate and supported by sound science and objectives.

#### Strategies

- Partner with U.S. Geological Survey (USGS), the University of Wyoming, and Colorado State University to develop and implement research objectives.
- Explore grants and other funding sources to provide for research needs.

### Rationale and Assumptions

The Laramie Plains refuges are primarily native grasslands. The decline of grassland nesting birds has been attributed to habitat loss and conversion, fragmentation, and the disruption of ecological factors, such as fire, which created a mosaic of habitat types across the landscape. As a result, many grassland bird species are now considered species of biological concern (USFWS 2002). Managing natural areas for these bird species involves providing the nesting habitat requirements and food resources essential for their reproduction and survival. These requirements include large, treeless patches containing within them diversity in vegetation structure.

Many shorebirds also use the refuges. Willet, a breeding shorebird common on the refuges, requires large expanses of short, sparse grasslands for nesting and foraging and wetland complexes for foraging (Stewart 1975, Kantrud and Higgins 1992, Dechant et al. 2003). In both upland and wetland habitats, adults with broods use somewhat taller, denser grass cover than do breeding pairs during nesting (Ryan and Renken 1987). Willets also prefer native grass to tame vegetation (Stewart 1975, Kantrud and Higgins 1992, Dechant et al. 2003) and shallow-water wetlands with short, sparse shoreline vegetation. Suitable wetlands range from fresh to saline and vary widely in size and permanence (Dechant et al. 2003).

A common upland bird to the area is the horned lark. Horned larks have been observed on the refuge, but most surveys of the area have concentrated on

wetland areas. A lack of data on upland birds' use of the refuge hampers upland management decisions.

Though horned larks have been identified in the area, the Service does not have any data on the effects of current grazing, condition of uplands, or other biological information due to a lack of monitoring. The lack of site-specific biological information on these species' use of refuge lands and personnel dedicated to guide management practices (prescribed fire, grazing, haying, and mowing) needs to be corrected by gathering data and evaluating such management practices for the benefits they offer to wildlife resources. Baseline information on vegetative structure, composition, and quality as well as water quality are imperative to guide proper management decisions.

### Objective 2

Within 10 years, identify and map invasive plant infestations (other than tamarisk) and initiate control procedures. Determine target percent control following this process.

#### Strategies

- Continue and improve partnership with Albany County Weed and Pest for noxious weed management using all appropriate known strategies such as chemical, biological, cultural, and mechanical controls.
- Use prescribed fire to reduce and control invasive species.

#### Rationale and Assumptions

For native birds to be retained, invasive plants must be controlled (Marzluff and Ewing 2001). Invasive species pose a serious threat to existing fish and wildlife resources. Once invasive plants are present, it is important to maximize efforts to gain control of them. Currently, there are no large infestations. Continued monitoring, improved by hiring a dedicated Service employee for the Laramie Plains refuges, will ensure that any noted invasive plants will be mapped and control procedures will be initiated.



Pronghorn.

USFWS

## Visitor Services Goal

Provide wildlife-dependent recreational opportunities to a diverse audience when the administration of these programs does not adversely affect habitat management objectives.

### Objective 1

Within 5 years of plan approval, enhance nonconsumptive wildlife-dependent recreation by developing a visitor services plan and supporting facilities to address refuge activities, access, and circulation.

#### Strategies

- Develop visitor services plan.
- Establish a formal parking area with informational kiosks and brochures.
- Provide walk-in access and accessible trails with markers to designate walking trails to the best wildlife-viewing areas.
- Close roads where necessary to facilitate implementation of visitor services plan and decrease disturbance to wildlife, discourage illegal hunting, and improve maintenance.
- Update refuge informational brochures and wildlife list to Service standards.
- Construct accessible photography blinds on Lake George and Rush and Hutton lakes.
- Provide educational materials on wildlife photography techniques.
- Provide an annual educational opportunity with experienced wildlife photographers sharing their expertise.

#### Rationale and Assumptions

The lakes provide wildlife-viewing and wildlife photography opportunities. The public can observe and enjoy a variety of wildlife including white-tailed prairie dogs, raptors, waterfowl, shorebirds, and other migratory species.

Currently roads consist mainly of two tracks randomly traversing the refuge in an undefined pattern. Vehicles traveling on the two tracks create new roads and trails when conditions are muddy or when pursuing a wildlife-viewing opportunity not near a roadway. Conducting a site circulation assessment and closing refuge roads where needed would reduce law enforcement issues and foster a quiet, quality wildlife-dependent recreational opportunity.

### Objective 2

Within 10 years of plan approval, improve wildlife educational opportunities.



### Strategies

- In cooperation with University of Wyoming, Wyoming Audubon, and others, offer scheduled environmental education opportunities at Hutton Lake NWR.
- Create programs for students and volunteers to assist in refuge management activities.
- Provide educational opportunities to local youth organizations such as Boy Scouts and Girl Scouts.

### Rationale and Assumptions

The public should be made aware of the Refuge System in general and this refuge in particular, as well as the benefits refuges provide to wildlife and the community. The refuge's proximity to Laramie makes it accessible for environmental education opportunities from kindergarten through college.

## Mortenson Lake NWR Management Direction

The following goals, objectives, and strategies for Mortenson Lake NWR outline the actions needed to achieve the vision of the Laramie Plains refuges. The Service intends to meet these objectives during the next 15 years.

### Wetlands Goal

Following considerations for Wyoming toad needs, manage refuge impoundments and other wetlands to create diverse habitat for wetland-dependent wildlife.



*American avocet.*

### Objective 1

Within 8 years, develop and implement protocols for increased water management and monitoring of water quality on Garber, Gibbs, and Soda lakes for the benefit of migrating waterfowl and for the

nesting and feeding benefits of shorebirds and other water-dependent birds.

### Strategies

- Work with the USFWS region 6, divisions of water resources and ecological services, to resolve water-quality issues.
- Develop an infrastructure improvement plan for dikes, water-control structures, and ditches.

### Rationale and Assumptions

High alkalinity in Garber, Gibbs, and Soda lakes reduces habitat suitable for the toad. These lakes are known to have alkalinity problems, but no specific data is available. Gibbs Lake is surrounded by short-grass prairie with little wetland vegetation, which also limits habitat for the toad.

In 1993, a flow-through system was installed on Garber Lake in an attempt to reduce the alkalinity to improve habitat for the Wyoming toad. Waterfowl, shorebirds, and other wetland-dependent birds currently use the three lakes, but increased water management (water-level control, flushing water through the system) and water quality could improve the lakes for a greater benefit to these birds as well as the Wyoming toad.

### Objective 2

Within 5 years, investigate the opportunities for acquiring more water rights and initiate the acquisition on any feasible possibility.

### Strategies

- Work with USFWS region 6, division of water resources, to pursue additional water rights and seek adjudication of existing storage rights.
- Purchase upgradient irrigated acreage, which supplies runoff and seepage to the refuge before it is dried up and subdivided.

### Rationale and Assumptions

Water rights on the refuge are limited, with water sources being runoff from melting snow, natural springs, and water from return flows off land irrigated by the Pioneer ditch. The refuge does not own any A or B shares on the Pioneer ditch (USFWS 1992). A refuge neighbor owns some of these shares and uses them to help the refuge irrigate some lands around Soda Lake. This irrigation water also helps water flow through Soda Lake into Gibbs Lake. The refuge does have storage rights on Soda, Harmon, and Mortenson lakes, but none of the rights are adjudicated. If water rights



were available for purchase, the refuge wetlands and irrigation lands would benefit greatly if the Service could acquire them.

## Uplands Goal

Following consideration for Wyoming toad needs, manage shrub- and grass-dominated uplands for the benefit of migratory birds (willet, horned lark, vesper sparrow), white-tailed prairie dogs, pronghorn, and other wildlife.

### Objective 1

Within 3 years, initiate baseline data studies to identify flora and fauna species composition and distribution, as well as habitat types and their distribution on the refuge. Conduct adaptive management over the life of the plan.

#### Strategies

Same strategies as Hutton Lake NWR Uplands objective 1.

#### Rationale and Assumptions

Same rationale and assumptions as Hutton Lake NWR Uplands objective 1.

### Objective 2

Within 5 years, identify and map invasive plant infestations and initiate control procedures. Determine target percent control following this process.

#### Strategies

Same strategies as Hutton Lake NWR Uplands objective 2.

#### Rationale and Assumptions

Same rationale and assumptions as Hutton Lake NWR Uplands objective 2.

## Wyoming Toad Goal

In conjunction with the Wyoming Toad Recovery Team, manage refuge lands around Mortenson Lake and other areas on the refuge as necessary to protect, create, and manage habitat suitable for Wyoming toad recovery from endangered status.

### Objective 1

Maintain 40 percent of the habitat over a 5-year average in the moist margin of Mortenson Lake proper with 35–39 percent horizontal vegetative cover (dominant species: American bulrush and creeping spike, or species with similar morphology)

and 20 percent open areas in mosaic conditions for metamorphs and juvenile (<2-year-olds) Wyoming toads.

#### Strategies

- Graze cattle to stimulate or maintain habitat conditions.
- Use prescribed fire to stimulate or maintain habitat conditions.
- Use mechanical manipulation (mow) to stimulate or maintain habitat conditions.
- Manipulate water (flood and drawdown) to stimulate habitat conditions.
- Develop vegetative monitoring protocol.

#### Rationale and Assumptions

Two master's theses (Withers 1992 and Parker 2000), background information, and the Wyoming Toad Recovery Team indicate that the habitat conditions detailed above are beneficial to the growth and survival of the Wyoming toad. Vegetative type and percent cover for metamorphs and juveniles are based on Withers's study, with the lower percentage used more by the metamorphs and the higher percentage used more by the juveniles. The vegetative percentage cover for adults is based on Parker's study. The vegetative cover percentages are based on the habitat as a whole, with each cover fulfilling a part of the habitat for a total of 100 percent. The lake's moist margin is defined as the area of ample soil moisture favored by the Wyoming toad at Mortenson Lake. On a 4-point moisture scale (1 = dry, 2 = moist, 3 = saturated, 4 = standing water), Wyoming toads use moist 2.0 to supersaturated 3.6 soils (Withers 1992).

One report questions Parker's habitat-use data because none of the toads in his study were wild: "The determination of habitat use and preference is fraught with difficulties such as spatial and serial autocorrelation, nonindependence of proportions, and definitions of habitat availability" (Drietz 2006). Parker also questions Withers's claim of habitat cover needs for adult Wyoming toads in an article in the "Journal of Wildlife Management." He states that adult toads used habitat with more vegetation cover than was documented in the past (Parker and Anderson 2003).

The objectives for the Wyoming toad are based on the best available science. As research becomes available, the objectives will change to reflect new data and knowledge.

### Objective 2

Maintain 40 percent of the habitat over a 5-year average in the moist margin of Mortenson Lake

proper with a mean of 55 percent horizontal vegetative cover (dominant species: American bulrush and creeping spike, or species with similar morphology) and 20 percent open areas in mosaic conditions for adult Wyoming toads.

### Strategies

Same as objective 1.

### Rationale and Assumptions

Same as objective 1.

### Objective 3

Manage water levels on Mortenson Lake to mimic conditions prior to refuge establishment with drawdowns starting in early May. Maintain water levels in late May or early June for egg masses. Prior to initiating another drawdown, conduct surveys for egg masses to determine if hatching has occurred. Once hatching is completed, begin another drawdown and continue to draw down until about mid-July to provide basking areas for adults and shallow warm water for tadpoles.

### Strategies

- Conduct egg mass surveys.
- Conduct breeding calling surveys.



*Damselflies mating.*

USFWS

- Develop monitoring protocols.
- Monitor water quality.

### Rationale and Assumptions

Two master's theses (Withers 1992 and Parker 2000), background information, and the Wyoming Toad Recovery Team indicate that the water-level manipulation described above should enhance Wyoming toad habitat. This drawdown effort is an attempt to mimic prerefuge management of Mortenson Lake. The Recovery Team believes that the management practice over the past 15 years of keeping the lake full throughout the spring and into the summer may be a factor in the perceived decline of Wyoming toads at Mortenson Lake. Prerefuge water manipulations would create shallow stable water 3.5–6.3 centimeters deep for egg development, warm shallow water for tadpoles, and eventually dry moist areas for adult toads to bask in (Withers 1992). Draw down of Mortenson Lake would be approximately 1.6 feet over the 3-month time frame.

### Objective 4

Continue to work with the Recovery Team following their recommendations for habitat conditions for the Wyoming toad as new science emerges.

### Strategy

- Continue to have a Service staff member participate as a member of the Recovery Team.

### Rationale and Assumptions

The Recovery Team is on the forefront of all new science concerning the toad. The team's recommendations will reflect the most up-to-date science and on-the-ground experience.

## STAFFING AND FUNDING

Currently, the Arapaho NWR Complex has a staff of five full-time employees. All five employees work in the complex with duties at Arapaho NWR, the three Laramie Plains refuges, and Pathfinder NWR near Casper, Wyoming. Table 4 lists these positions, along with one new position (specifically assigned to the Laramie Plains refuges and Pathfinder NWR) that is needed for full implementation of the CCP. Projects required to carry out the CCP are funded through two separate systems, as follows:

- The refuge operations needs system (RONS) is used to document requests to Congress for funding and staffing needed to carry out projects above the existing base budget.

**Table 4. Current and proposed staff for the Arapaho NWR Complex, including Arapaho NWR, Colorado, and Bamforth NWR, Hutton Lake NWR, Mortenson Lake NWR, and Pathfinder NWR, Wyoming.**

	Current Positions GS=General Schedule Positions WG=Wage Grade Positions	Additional Proposed Positions (Unfunded staffing)
<i>Management Staff</i>	refuge project leader, GS-12* refuge operations specialist, GS-11*	refuge operations specialist, GS-9
<i>Biological Staff</i>	wildlife biologist, GS-9*	no additional positions
<i>Visitor Services Staff</i>	None	none
<i>Administrative Staff</i>	administrative assistant, GS-8*	no additional positions
<i>Maintenance Staff</i>	maintenance worker, WG-8*	no additional positions
<i>Law Enforcement Staff</i>	none	none
<i>Fire Management Staff</i>	none	none

\*This position supports the Laramie Plains refuges but is assigned to the Arapaho NWR Complex and works at all five stations.

- The Service asset maintenance management system (SAMMS) is used to document the equipment, buildings, and other existing properties that require repair or replacement.

## STEP-DOWN MANAGEMENT PLANS

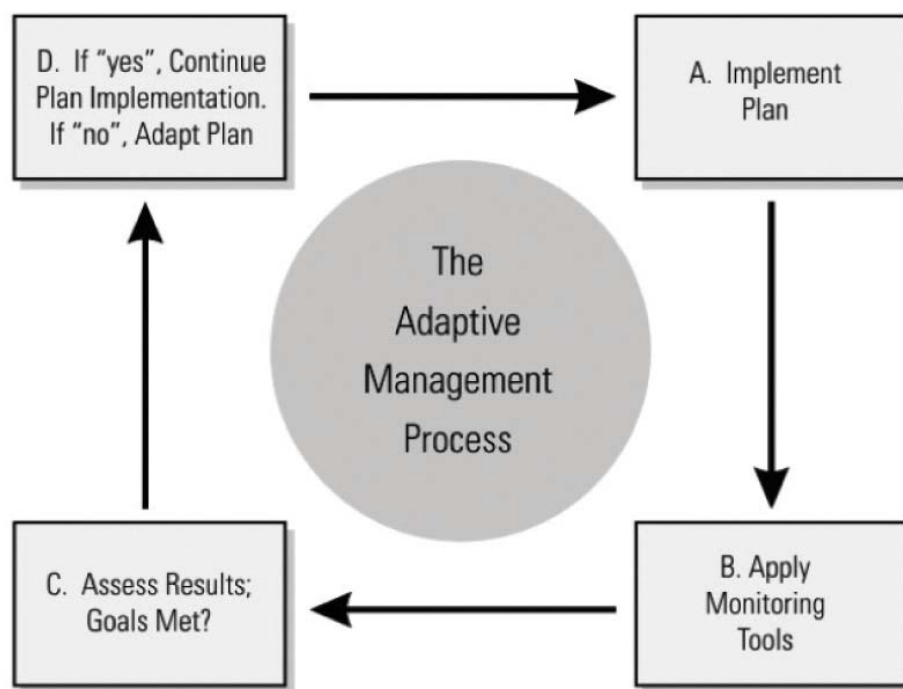
The CCP for the Laramie Plains refuges is intended to be a broad umbrella plan that (1) outlines general concepts and objectives for habitat, wildlife, visitor services, cultural resources, and partnerships; and (2) guides refuge management for the next 15 years. Step-down management plans provide greater detail for carrying out specific actions authorized by the CCP. Table 5 presents step-down management plans for the refuges that are anticipated to be needed, along with their current status and next revision date.

## MONITORING AND EVALUATION

Adaptive management is a flexible approach to long-term management of biotic resources. Adaptive management is directed, over time, by the results of ongoing monitoring activities and other information.

More specifically, adaptive management is a process by which projects are carried out within a framework of scientifically driven experiments to test the predictions and assumptions outlined with a CCP (figure 18).

To apply adaptive management, specific survey, inventory, and monitoring protocols will be adopted for the Laramie Plains refuges. The habitat management strategies will be systematically evaluated to determine management effects on wildlife populations. This information will be used to refine approaches and determine how effectively the objectives are being accomplished. If monitoring and evaluation indicate undesirable effects for target and



**Figure 18. The adaptive management process.**

**Table 5. Step-down management plans for the Laramie Plains refuges, Wyoming.**

<i>Step-down Management Plan</i>	<i>Completed Plan, Year Approved</i>	<i>New or Revised Plan, Completion Year</i>
Fire management plan	2001	2009
Habitat management plan	—	2012
Habitat management plan (annual)	—	2009
Integrated pest management plan	2007	N/A
Law enforcement plan	—	2017
Safety plan	Under plan for Arapaho NWR Complex	2008
Visitor services plan (applies only to Hutton Lake NWR)	—	2010
Water management plan	2007	N/A



# Glossary of Terms

**accessible**—Pertaining to physical access to areas and activities for people of different abilities, especially those with physical impairments.

**adaptive resource management**—The rigorous application of management, research, and monitoring to gain information and experience necessary to assess and modify management activities; a process that uses feedback from research, monitoring, and evaluation of management actions to support or modify objectives and strategies at all planning levels; a process in which policy decisions are implemented within a framework of scientifically driven experiments to test predictions and assumptions inherent in management plan. Analysis of results helps managers determine whether current management should continue as is or whether it should be modified to achieve desired conditions.

**Administration Act**—National Wildlife Refuge System Administration Act of 1966.

**alternative**—A reasonable way to solve an identified problem or satisfy the stated need (40 CFR 1500.2); one of several different means of accomplishing refuge purposes and goals and contributing to the Refuge System mission (“Draft Service Manual” 602 FW 1.5).

**amphibian**—A class of cold-blooded vertebrates including frogs, toads or salamanders.

**animal unit month (AUM)**—Measure of the quantity of livestock forage. Equivalent to the amount of forage needed to support a 1,000-pound animal (or one cow/calf pair) for 1 month.

**annual**—A plant that flowers and dies within 1 year of germination.

**ATV**—All-terrain vehicle.

**AUM**—*See* animal unit month.

**baseline**—A set of critical observations, data, or information used for comparison or as a control.

**biological control**—The use of organisms or viruses to control invasive plants or other pests.

**biological diversity, also biodiversity**—The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur (Service Manual 052 FW 1.12B). The National

Wildlife Refuge System’s focus is on indigenous species, biotic communities, and ecological processes.

**biotic**—Pertaining to life or living organisms; caused, produced by, or comprising living organisms.

**canopy**—A layer of foliage, generally the uppermost layer, in a vegetative stand; midlevel or understory vegetation in multilayered stands. Canopy closure (*also* canopy cover) is an estimate of the amount of overhead vegetative cover.

**CCC**—*See* Civilian Conservation Corps.

**CCP**—*See* comprehensive conservation plan.

**CFR**—*See* Code of Federal Regulations.

**cfs**—cubic feet per second.

**Civilian Conservation Corps (CCC)**—Peacetime civilian “army” established by President Franklin D. Roosevelt to perform conservation activities from 1933 to 1942. Activities included erosion control; firefighting; tree planting; habitat protection; stream improvement; and building of fire towers, roads, recreation facilities, and drainage systems.

**Code of Federal Regulations (CFR)**—The codification of the general and permanent rules published in the “Federal Register” by the executive departments and agencies of the federal government. Each volume of the CFR is updated once each calendar year.

**compatibility determination**—*See* compatible use.

**compatible use**—A wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the director of the U.S. Fish and Wildlife Service, will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge (“Draft Service Manual” 603 FW 3.6). A compatibility determination supports the selection of compatible uses and identified stipulations or limits necessary to ensure compatibility.

**comprehensive conservation plan (CCP)**—A document that describes the desired future conditions of the refuge and provides long-range guidance and management direction for the refuge manager to accomplish the purposes of the refuge, contribute to the mission of the Refuge System, and to meet other relevant mandates (“Draft Service Manual” 602 FW 1.5).

**concern**—*See* issue.

**cool-season grasses**—Grasses that begin growth earlier in the season and often become dormant in the summer. These grasses will germinate at lower temperatures. Examples of cool-season grasses are western wheatgrass, needleandthread, and green needlegrass.

**cover, also cover type, canopy cover**—Present vegetation of an area.

**cultural resources**—The remains of sites, structures, or objects used by people in the past.

**dense nesting cover (DNC)**—A composition of grasses and forbs that allows for a dense stand of vegetation that protects nesting birds from the view of predators, usually consisting of one to two species of wheatgrass, alfalfa, and sweetclover.

**depredation**—Destruction or consumption of eggs, broods, or individual wildlife due to a predatory animal; damage inflicted on agricultural crops or ornamental plants by wildlife.

**DNC**—*See* dense nesting cover.

**drawdown**—The act of manipulating water levels in an impoundment to allow for the natural drying-out cycle of a wetland.

**EA**—*See* environmental assessment.

**ecosystem**—A dynamic and interrelating complex of plant and animal communities and their associated nonliving environment; a biological community, together with its environment, functioning as a unit. For administrative purposes, the Service has designated 53 ecosystems covering the United States and its possessions. These ecosystems generally correspond with watershed boundaries and their sizes and ecological complexity vary.

**EIS**—environmental impact statement.

**emergent**—A plant rooted in shallow water and having most of the vegetative growth above water, such as cattail and hardstem bulrush.

**endangered species, federal**—A plant or animal species listed under the Endangered Species Act of 1973, as amended, that is in danger of extinction throughout all or a significant portion of its range.

**endangered species, state**—A plant or animal species in danger of becoming extinct or extirpated in a particular state within the near future if factors contributing to its decline continue. Populations of these species are at critically low levels or their habitats have been degraded or depleted to a significant degree.

**endemic species**—Plants or animals that occur naturally in a certain region and whose distribution is relatively limited to a particular locality.

**environmental assessment (EA)**—A concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action and alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact (40 CFR 1508.9).

**EPA**—Environmental Protection Agency.

**extinction**—The complete disappearance of a species from the earth; no longer existing.

**extirpation**—The extinction of a population; complete eradication of a species within a specified area.

**fauna**—All the vertebrate and invertebrate animals of an area.

**federal trust resource**—A trust is something managed by one entity for another that holds the ownership. The Service holds in trust many natural resources for the people of the United States of America as a result of federal acts and treaties. Examples are species listed under the Endangered Species Act, migratory birds protected by international treaties, and native plant or wildlife species found on a national wildlife refuge.

**federal trust species**—All species where the federal government has primary jurisdiction including federally endangered or threatened species, migratory birds, anadromous fish, and certain marine mammals.

**flora**—All the plant species of an area.

**FMP**—fire management plan.

**forb**—A broad-leaved, herbaceous plant; a seed-producing annual, biennial, or perennial plant that does not develop persistent woody tissue but dies down at the end of the growing season.

**fragmentation**—The alteration of a large block of habitat that creates isolated patches of the original habitat that are interspersed with a variety of other habitat types; the process of reducing the size and connectivity of habitat patches, making movement of individuals or genetic information between parcels difficult or impossible.

**“friends” group**—Any formal organization whose mission is to support the goals and purposes of its associated refuge and the National Wildlife Refuge Association overall; “friends” organizations and cooperative and interpretive associations.

**FWS**—*See* U.S. Fish and Wildlife Service.

**geographic information system (GIS)**—A computer system capable of storing and manipulating spatial data; a set of computer hardware and software for analyzing and displaying spatially referenced features (such as points, lines, and polygons) with nongeographic attributes such as species and age.

**goal**—Descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose but does not define measurable units (“Draft Service Manual” 620 FW 1.5).

**grassland tract**—A contiguous area of grassland without fragmentation.

**GS**—general schedule (pay-rate schedule for certain federal positions).

**habitat**—Suite of existing environmental conditions required by an organism for survival and reproduction; the place where an organism typically lives and grows.

**habitat disturbance**—Significant alteration of habitat structure or composition; may be natural (for example, wildland fire) or human-caused events (for example, timber harvest and disking).

**habitat type, also vegetation type, cover type**—A land classification system based on the concept of distinct plant associations.

**HMP**—habitat management plan.

**impoundment**—A body of water created by collection and confinement within a series of levees or dikes, creating separate management units although not always independent of one another.

**Improvement Act**—National Wildlife Refuge System Improvement Act of 1997.

**indigenous**—Originating or occurring naturally in a particular place.

**integrated pest management (IPM)**—Methods of managing undesirable species such as invasive plants; education, prevention, physical or mechanical methods of control, biological control, responsible chemical use, and cultural methods.

**introduced species**—A species present in an area due to intentional or unintentional escape, release, dissemination, or placement into an ecosystem as a result of human activity.

**invasive plant, also noxious weed**—A species that is nonnative to the ecosystem under consideration and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health.

**IPM**—*See* integrated pest management.

**issue**—Any unsettled matter that requires a management decision; for example, a Service initiative, opportunity, resource management problem, a threat to the resources of the unit, conflict in uses, public concern, or the presence of an undesirable resource condition (“Draft Service Manual” 602 FW 1.5).

**management alternative**—*See* alternative.

**migration**—Regular extensive, seasonal movements of birds between their breeding regions and their wintering regions; to pass usually periodically from one region or climate to another for feeding or breeding.

**migratory birds**—Birds that follow a seasonal movement from their breeding grounds to their wintering grounds. Waterfowl, shorebirds, raptors, and songbirds are all migratory birds.

**mission**—Succinct statement of purpose and/or reason for being.

**mitigation**—Measure designed to counteract an environmental impact or to make an impact less severe.

**monitoring**—The process of collecting information to track changes of selected parameters over time.

**national wildlife refuge (NWR)**—A designated area of land, water, or an interest in land or water within the National Wildlife Refuge System, but does not include coordination areas; a complete listing of all units of the Refuge System is in the current “Annual Report of Lands Under Control of the U.S. Fish and Wildlife Service.”

**National Wildlife Refuge System (Refuge System)**—Various categories of areas administered by the Secretary of the Interior for the conservation of fish and wildlife including species threatened with extinction; all lands, waters, and interests therein administered by the Secretary as wildlife refuges; areas for the protection and conservation of fish and wildlife that are threatened with extinction; wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas.

**National Wildlife Refuge System Improvement Act of 1997 (Improvement Act)**—Sets the mission and the administrative policy for all refuges in the National Wildlife Refuge System; defines a unifying mission for the Refuge System; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation); establishes a formal process for determining appropriateness and compatibility; establish the responsibilities of the Secretary of the Interior for managing and protecting the Refuge System; requires a comprehensive conservation plan

for each refuge by the year 2012. This Act amended portions of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

**native species**—A species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

**Neotropical migrant**—A bird species that breeds north of the United States and Mexican border and winters primarily south of this border.

**NEPA**—National Environmental Policy Act.

**nest success**—The percentage of nests that successfully hatch one or more eggs of the total number of nests initiated in an area.

**NOA**—notice of availability.

**nongovernmental organization**—Any group that is not composed of federal, state, tribal, county, city, town, local, or other governmental entities.

**noxious weed, also invasive plant**—Any living stage (including seeds and reproductive parts) of a parasitic or other plant of a kind that is of foreign origin (new to or not widely prevalent in the U.S.) and can directly or indirectly injure crops, other useful plants, livestock, poultry, other interests of agriculture, including irrigation, navigation, fish and wildlife resources, or public health. According to the Federal Noxious Weed Act (PL 93-639), a noxious weed (such as invasive plant) is one that causes disease or has adverse effects on humans or the human environment and, therefore, is detrimental to the agriculture and commerce of the U.S. and to public health.

**NRCS**—Natural Resources Conservation Service of the U.S. Department of Agriculture.

**NWR**—*See* national wildlife refuge.

**objective**—An objective is a concise target statement of what will be achieved, how much will be achieved, when and where it will be achieved, and who is responsible for the work; derived from goals, objectives provide the basis for determining management strategies. Objectives should be attainable and time-specific and should be stated quantitatively to the extent possible. If objectives cannot be stated quantitatively, they may be stated qualitatively (“Draft Service Manual” 602 FW 1.5).

**over-water species**—nesting species such as diving ducks and many colonial-nesting birds that build nests within dense stands of water-dependent plants, primarily cattail, or that build floating nests of vegetation that rest on the water.

**patch**—An area distinct from that around it; an area distinguished from its surroundings by environmental conditions.

**perennial**—Lasting or active through the year or through many years; a plant species that has a life span of more than 2 years.

**plant community**—An assemblage of plant species unique in its composition; occurs in particular locations under particular influences; a reflection or integration of the environmental influences on the site such as soil, temperature, elevation, solar radiation, slope, aspect, and rainfall; denotes a general kind of climax plant community, such as ponderosa pine or bunchgrass.

**playa**—A nearly level area at the bottom of an undrained desert basin, sometimes temporarily covered with water.

**prescribed fire**—The skillful application of fire to natural fuels under conditions such as weather, fuel moisture, and soil moisture that allows confinement of the fire to a predetermined area and produces the intensity of heat and rate of spread to accomplish planned benefits to one or more objectives of habitat management, wildlife management, or hazard reduction.

**priority public use**—One of six uses authorized by the National Wildlife Refuge System Improvement Act of 1997 to have priority if found to be compatible with a refuge’s purposes. This includes hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation.

**proposed action**—The alternative proposed to best achieve the purpose, vision, and goals of a refuge (contributes to the Refuge System mission, addresses the significant issues, and is consistent with principles of sound fish and wildlife management).

**public**—Individuals, organizations, and groups; officials of federal, state, and local government agencies; Native American tribes; and foreign nations. It may include anyone outside the core planning team. It includes those who may or may not have indicated an interest in Service issues and those who do or do not realize that Service decisions may affect them.

**public involvement**—A process that offers affected and interested individuals and organizations an opportunity to become informed about, and to express their opinions on, Service actions and policies. In the process, these views are studied thoroughly, and thoughtful consideration of public views is given in shaping decisions for refuge management.

**purpose of the refuge**—The purpose of a refuge is specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing authorization or expanding a refuge,



refuge unit, or refuge subunit (“Draft Service Manual” 602 FW 1.5).

**raptor**—A carnivorous bird such as a hawk, a falcon, or a vulture that feeds wholly or chiefly on meat taken by hunting or on carrion (dead carcasses).

**Reclamation**—Bureau of Reclamation of the U.S. Department of the Interior.

**refuge operations needs system (RONS)**—A national database that contains the unfunded operational needs of each refuge. Projects included are those required to implement approved plans and meet goals, objectives, and legal mandates.

**refuge purpose**—*See* purpose of the refuge.

**Refuge System**—*See* National Wildlife Refuge System.

**refuge use**—Any activity on a refuge, except administrative or law enforcement activity, carried out by or under the direction of an authorized Service employee.

**resident species**—A species inhabiting a given locality throughout the year; nonmigratory species.

**rest**—Free from biological, mechanical, or chemical manipulation, in reference to refuge lands.

**restoration**—Management emphasis designed to move ecosystems to desired conditions and processes, such as healthy upland habitats and aquatic systems.

**riparian area or riparian zone**—An area or habitat that is transitional from terrestrial to aquatic ecosystems including streams, lakes, wet areas, and adjacent plant communities and their associated soils that have free water at or near the surface; an area whose components are directly or indirectly attributed to the influence of water; of or relating to a river; specifically applied to ecology, “riparian” describes the land immediately adjoining and directly influenced by streams. For example, riparian vegetation includes all plant life growing on the land adjoining a stream and directly influenced by the stream.

**RONS**—*See* refuge operations needs system.

**SAMMS**—*See* Service Asset Maintenance Management System.

**scoping**—The process of obtaining information from the public for input into the planning process.

**seasonally flooded**—Surface water is present for extended periods in the growing season, but is absent by the end of the season in most years.

**sediment**—Material deposited by water, wind, and glaciers.

**Service**—*See* U.S. Fish and Wildlife Service.

### **Service Asset Maintenance Management System**

**(SAMMS)**—A national database that contains the unfunded maintenance needs of each refuge; projects include those required to maintain existing equipment and buildings, correct safety deficiencies for the implementation of approved plans, and meet goals, objectives, and legal mandates.

**shelterbelt**—Single to multiple rows of trees and shrubs planted around cropland or buildings to block or slow down the wind.

**shorebird**—Any of a suborder (*Charadrii*) of birds such as a plover or a snipe that frequent the seashore or mud flat areas.

**spatial**—Relating to, occupying, or having the character of space.

**special status species**—Plants or animals that have been identified through federal law, state law, or agency policy as requiring special protection of monitoring. Examples include federally listed endangered, threatened, proposed, or candidate species; state-listed endangered, threatened, candidate, or monitor species; Service’s species of management concern; species identified by the Partners in Flight program as being of extreme or moderately high conservation concern.

**special use permit**—A permit for special authorization from the refuge manager required for any refuge service, facility, privilege, or product of the soil provided at refuge expense and not usually available to the general public through authorizations in Title 50 CFR or other public regulations (“Refuge Manual” 5 RM 17.6).

**species of concern**—Those plant and animal species, while not falling under the definition of special status species, that are of management interest by virtue of being federal trust species such as migratory birds, important game species, or significant keystone species; species that have documented or apparent populations declines, small or restricted populations, or dependence on restricted or vulnerable habitats.

**spoil piles**—Spoil piles (also known as stock piles or storage piles) are excavated materials consisting of topsoil or subsoils that have been removed and temporarily stored during construction activity. Proper placement and stabilization of spoil piles helps reduce soil erosion.

**step-down management plan**—A plan that provides the details necessary to implement management strategies identified in the comprehensive conservation plan (“Draft Service Manual” 602 FW 1.5).

**strategy**—A specific action, tool, or technique or combination of actions, tools, and techniques used to meet unit objectives (“Draft Service Manual” 602 FW 1.5).

**submergent**—A vascular or nonvascular hydrophyte, either rooted or nonrooted, that lies entirely beneath the water surface, except for flowering parts in some species.

**threatened species, federal**—Species listed under the Endangered Species Act of 1973, as amended, that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

**threatened species, state**—A plant or animal species likely to become endangered in a particular state within the near future if factors contributing to population decline or habitat degradation or loss continue.

**travel corridor**—A landscape feature that facilitates the biologically effective transport of animals between larger patches of habitat dedicated to conservation functions. Such corridors may facilitate several kinds of traffic including frequent foraging movement, seasonal migration, or the once-in-a-lifetime dispersal of juvenile animals. These are transition habitats and need not contain all the habitat elements required for long-term survival or reproduction of its migrants.

**trust resource**—*See* federal trust resource.

**trust species**—*See* federal trust species.

**U.S. Fish and Wildlife Service (Service, USFWS, FWS)**—The principal federal agency responsible for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people. The Service manages the 93-million-acre National Wildlife Refuge System comprised of more than 530 national wildlife refuges and thousands of waterfowl production areas. It also operates 65 national fish hatcheries and 78 ecological service field stations; the agency enforces federal wildlife laws, manages migratory bird populations, restores national significant fisheries, conserves and restores wildlife habitat such as wetlands, administers the Endangered Species Act, and helps foreign governments with their conservation efforts. It also oversees the federal aid program that distributes millions of dollars in excise taxes on fishing and hunting equipment to state wildlife agencies.

**U.S. Geological Survey (USGS)**—A federal agency whose mission is to provide reliable scientific information to describe and understand the earth;

minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

**vision statement**—A concise statement of the desired future condition of the planning unit, based primarily on the Refuge System mission, specific refuge purposes, and other relevant mandates (“Draft Service Manual” 602 FW 1.5).

**visual obstruction**—Pertaining to the density of a plant community; the height of vegetation that blocks the view of predators and conspecifics to a nest.

**visual obstruction reading (VOR)**—A method of visually quantifying vegetative structure and composition.

**wading birds**—Birds having long legs that enable them to wade in shallow water including egrets, great blue herons, black-crowned night-herons, and bitterns.

**waterfowl**—A category of birds that includes ducks, geese, and swans.

**watershed**—The region draining into a river, a river system, or a body of water.

**wetland management district (WMD)**—Land that the Refuge System acquires with Federal Duck Stamp funds for restoration and management primarily as prairie wetland habitat critical to waterfowl and other wetland birds.

**WG**—wage grade schedule (pay-rate schedule for certain federal positions).

**wildland fire**—A free-burning fire requiring a suppression response; all fire other than prescribed fire that occurs on wildlands (Service Manual 621 FW 1.7).

**wildlife-dependent recreational use**—Use of a refuge involving hunting, fishing, wildlife observation, wildlife photography, environmental education, or interpretation. The National Wildlife Refuge System Improvement Act of 1997 specifies that these are the six priority general public uses of the Refuge System.

**WMD**—*See* wetland management district.

**woodland**—Open stands of trees with crowns not usually touching, generally forming 25–60 percent cover.

**WUI**—wildland–urban interface.

# Appendix A

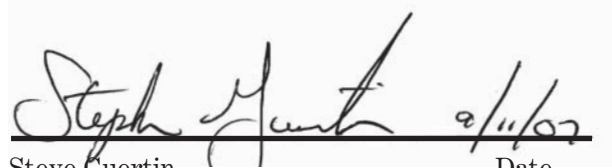
## *Environmental Compliance*

### **Environmental Action Statement**

U.S. Fish and Wildlife Service, Region 6  
Lakewood, Colorado

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record.


I have determined that the action of implementing the "Comprehensive Conservation Plan—Bamforth Lake National Wildlife Refuge, Hutton Lake National Wildlife Refuge, Mortenson Lake National Wildlife Refuge" is found not to have significant environmental effects, as determined by the attached "finding of no significant impact" and the environmental assessment as found with the draft comprehensive conservation plan.

A handwritten signature in black ink, appearing to read "Steve Guertin", followed by the date "9/11/07". The signature is written over a horizontal line.

Steve Guertin  
Regional Director, Region 6  
U.S. Fish and Wildlife Service  
Lakewood, CO

A handwritten signature in black ink, appearing to read "Richard A. Coleman", followed by the date "9/10/07". The signature is written over a horizontal line.

Richard A. Coleman, PhD  
Assistant Regional Director, Region 6  
National Wildlife Refuge System  
U.S. Fish and Wildlife Service  
Lakewood, CO

A handwritten signature in black ink, appearing to read "Dean Rundle", followed by the date "9-10-07". The signature is written over a horizontal line.

Dean Rundle  
Refuge Supervisor  
U.S. Fish and Wildlife Service, Region 6  
Lakewood, CO

A handwritten signature in black ink, appearing to read "Ann Timberman", followed by the date "9-10-07". The signature is written over a horizontal line.

Ann Timberman  
Project Leader  
Arapaho National Wildlife Refuge Complex  
Walden, CO

## Finding of No Significant Impact

U.S. Fish and Wildlife Service, Region 6  
Lakewood, Colorado

Three management alternatives for the Laramie Plains national wildlife refuges (Bamforth, Hutton Lake, and Mortenson Lake) were assessed as to their effectiveness in achieving the refuges' purposes and their impacts on the human environment.

- Alternative A, the "no-action" alternative, would continue current management.
- Alternative B would increase management activities on the refuges. Upland habitats would be evaluated and managed for the benefit of migratory bird species. Refuge staff would research the availability of additional water rights for the refuges. Monitoring and management of invasive species on the refuges would be increased. Wildlife-dependant recreation opportunities would be provided and enhanced at Hutton Lake NWR where compatible with refuge purposes. Efforts would be increased in the operations and maintenance of natural resources on the refuges and to maintain and develop partnerships that promote wildlife and habitat research and management.
- Alternative C would rely on partnerships to achieve refuge goals and objectives. Refuge management activities would be increased and enhanced through the use of partnerships. Refuge staff would strive to accomplish refuge work through partnerships with others. An emphasis on adaptive management, including monitoring the effects of habitat management practices and using research results to direct ongoing management, would be a priority.

Based on this assessment and the comments received, I have selected alternative B as the preferred alternative for implementation. The preferred alternative was selected because it best meets the purposes for which the Laramie Plains national wildlife refuges were established, and it is preferable to the "no-action" alternative in light of physical, biological, economic, and social factors. The preferred alternative would continue to improve public access for wildlife-dependant recreation at Hutton Lake NWR (wildlife observation, wildlife photography, environmental education, and interpretation).

I find that the preferred alternative is not a major federal action that would significantly affect the

quality of the human environment within the meaning of Section 102(2)(C) of the National Environmental Policy Act of 1969. Accordingly, the preparation of an environmental impact statement on the proposed action is not required.

The following is a summary of anticipated environmental effects from implementation of the preferred alternative:

- The preferred alternative will not adversely impact endangered or threatened species or their habitat.
- The preferred alternative will not adversely impact archeological or historical resources.
- The preferred alternative will not adversely impact wetlands, nor does the plan call for structures that could be damaged by or that would significantly influence the movement of floodwater.
- The preferred alternative will not have a disproportionately high or adverse human health or environmental effect on minority or low-income populations.
- The state of Wyoming has been notified and given the opportunity to review the comprehensive conservation plan and associated environmental assessment.

 9/16/57  
Date

Steve Guertin  
Regional Director, Region 6  
U.S. Fish and Wildlife Service  
Lakewood, CO



# Appendix B

## Key Legislation and Policies

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This appendix briefly describes the guidance for the National Wildlife Refuge System and other policies and key legislation that guide the management of the Laramie Plains refuges.

### NATIONAL WILDLIFE REFUGE SYSTEM

*The mission of the Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*

National Wildlife Refuge System Improvement Act of 1997.

#### Goals

- Fulfill our statutory duty to achieve refuge purpose(s) and further the System mission.
- Conserve, restore where appropriate, and enhance all species of fish, wildlife, and plants that are endangered or threatened with becoming endangered.
- Perpetuate migratory bird, interjurisdictional fish, and marine mammal populations.
- Conserve a diversity of fish, wildlife, and plants.
- Conserve and restore, where appropriate, representative ecosystems of the United States, including the ecological processes characteristic of those ecosystems.
- Foster understanding and instill appreciation of fish, wildlife, and plants, and their conservation, by providing the public with safe, high-quality, and compatible wildlife-dependent public use. Such use includes hunting, fishing, wildlife observation and photography, environmental education, and interpretation.

#### Guiding Principles

There are four guiding principles for management and general public use of the Refuge System established by Executive Order 12996 (1996):

- **Public Use**—The Refuge System provides important opportunities for compatible wildlife-dependent recreational activities involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation.
- **Habitat**—Fish and wildlife will not prosper without high-quality habitat, and without fish and wildlife, traditional uses of refuges cannot be sustained. The Refuge System will continue to conserve and enhance the quality and diversity of fish and wildlife habitat within refuges.
- **Partnerships**—America's sportsmen and women were the first partners who insisted on protecting valuable wildlife habitat within wildlife refuges. Conservation partnerships with other federal agencies, state agencies, tribes, organizations, industry, and the general public can make significant contributions to the growth and management of the Refuge System.
- **Public Involvement**—The public should be given a full and open opportunity to participate in decisions regarding acquisition and management of our national wildlife refuges.

### LEGAL AND POLICY GUIDANCE

Management actions on national wildlife refuges are circumscribed by many mandates including laws and executive orders, the latest of which is the Volunteer and Community Partnership Enhancement Act of 1998. Regulations that affect refuge management the most are listed below.

**American Indian Religious Freedom Act (1978)**—Directs agencies to consult with native traditional religious leaders to determine appropriate policy changes necessary to protect and preserve Native American religious cultural rights and practices.

**Americans with Disabilities Act (1992)**—Prohibits discrimination in public accommodations and services.

**Antiquities Act (1906)**—Authorizes the scientific investigation of antiquities on federal land and provides penalties for unauthorized removal of objects taken or collected without a permit.

**Archaeological and Historic Preservation Act (1974)**—Directs the preservation of historic and archaeological data in federal construction projects.

**Archaeological Resources Protection Act (1979), as amended**—Protects materials of archaeological interest from unauthorized removal or destruction and requires federal managers to develop plans and schedules to locate archaeological resources.

**Architectural Barriers Act (1968)**—Requires federally owned, leased, or funded buildings and facilities to be accessible to persons with disabilities.

**Clean Water Act (1977)**—Requires consultation with the U.S. Army Corps of Engineers (404 permits) for major wetland modifications.

**Endangered Species Act (1973)**—Requires all federal agencies to carry out programs for the conservation of endangered and threatened species.

**Executive Order No. 7168 (1935)**—Establishes Arrowwood Migratory Waterfowl Refuge “as a refuge and breeding ground for migratory birds and other wild life... to effectuate further the purposes of the Migratory Bird Conservation Act.”

**Executive Order 11988 (1977)**—Requires federal agencies to provide leadership and take action to reduce the risk of flood loss, minimize the impact of floods on human safety, and preserve the natural and beneficial values served by the floodplains.

**Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System (1996)**—Defines the mission, purpose, and priority public uses of the National Wildlife Refuge System. It also presents four principles to guide management of the Refuge System.

**Executive Order 13007, Indian Sacred Sites (1996)**—Directs federal land management agencies to accommodate access to and ceremonial uses of Indian sacred sites by Indian religious practitioners, avoid adversely affecting the physical integrity of such sacred sites, and where appropriate, maintain the confidentiality of sacred sites.

**Federal Noxious Weed Act (1990)**—Requires the use of integrated management systems to control or contain undesirable plant species and an interdisciplinary approach with the cooperation of other federal and state agencies.

**Federal Records Act (1950)**—Requires the preservation of evidence of the government’s organization, functions, policies, decisions, operations, and activities, as well as basic historical and other information.

**Fish and Wildlife Coordination Act (1958)**—Allows the U.S. Fish and Wildlife Service to enter into agreements with private landowners for wildlife management purposes.

**Migratory Bird Conservation Act (1929)**—Establishes procedures for acquisition by purchase, rental, or gifts of areas approved by the Migratory Bird Conservation Commission.

**Migratory Bird Hunting and Conservation Stamp Act (1934)**—Authorizes the opening of part of a refuge to waterfowl hunting.

**Migratory Bird Treaty Act (1918)**—Designates the protection of migratory birds as a federal responsibility; and enables the setting of seasons and other regulations, including the closing of areas, federal or nonfederal, to the hunting of migratory birds.

**National Environmental Policy Act (1969)**—Requires all agencies, including the Service, to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in the planning and implementation of all actions. Federal agencies must integrate this act with other planning requirements, and prepare appropriate documents to facilitate better environmental decision making (40 CFR 1500).

**National Historic Preservation Act (1966), as amended**—Establishes as policy that the federal government is to provide leadership in the preservation of the nation’s prehistoric and historical resources.

**National Wildlife Refuge System Administration Act (1966)**—Defines the National Wildlife Refuge System and authorizes the Secretary of the Interior to permit any use of a refuge, provided such use is compatible with the major purposes for which the refuge was established.

**National Wildlife Refuge System Improvement Act of 1997**—Sets the mission and administrative policy for all refuges in the National Wildlife Refuge System; mandates comprehensive conservation planning for all units of the Refuge System.

**Native American Graves Protection and Repatriation Act (1990)**—Requires federal agencies and museums to inventory, determine ownership of, and repatriate cultural items under their control or possession.

**Refuge Recreation Act (1962)**—Allows the use of refuges for recreation when such uses are compatible with the refuge’s primary purposes and when sufficient funds are available to manage the uses.

**Rehabilitation Act (1973)**—Requires programmatic accessibility in addition to physical accessibility for all facilities and programs funded by the federal government to ensure that any person can participate in any program.

**Rivers and Harbors Act (1899)**—Section 10 of this act requires the authorization of U.S. Army Corps of Engineers prior to any work in, on, over, or under navigable waters of the United States.

**Volunteer and Community Partnership Enhancement Act (1998)**—Encourages the use of volunteers to assist in the management of refuges within the Refuge System; facilitates partnerships between the Refuge System and nonfederal entities to promote public awareness of the resources of the Refuge System and public participation in the conservation of the resources; and encourages donations and other contributions.





# Appendix C

## *List of Preparers, Consultation, and Coordination*

This document is the result of the extensive, collaborative, and enthusiastic efforts by the seven members of the Laramie Plains refuges planning team below. Many others contributed insight and support.

### Planning Team

<i>Team Member</i>	<i>Position</i>	<i>Work Unit</i>
Andrea Cerovski	Wildlife biologist	Wyoming Game and Fish Department; Lander, WY
Mark Ely	Geographic information system (GIS) specialist	USFWS, Region 6; Lakewood, CO
Toni Griffin	Planning team leader	USFWS, Region 6; Lakewood, CO
Pam Johnson	Wildlife biologist	Arapaho NWR; Walden, CO
Mark Lanier	<i>Former</i> assistant refuge manager	Arapaho NWR; Walden, CO
Larry Roberts	Wildlife biologist	Wyoming Game and Fish Department; Casper, WY
Ann Timberman	Project leader	Arapaho NWR; Walden, CO

### Contributors

The Service would like to acknowledge the efforts of the following individuals and organizations toward the completion of this CCP. The diversity, talents, and knowledge they contributed dramatically improved the vision and completeness of this document.

<i>Name</i>	<i>Position</i>	<i>Work Unit</i>
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Wayne King	Biologist, refuge system	USFWS
Bud Oliveira	Refuge supervisor	USFWS
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Dean Rundle	Former refuge supervisor	USFWS
Richard Schroeder	Wildlife biologist	USGS

<i>Name</i>	<i>Position</i>	<i>Work Unit</i>
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Dave Wiseman	Refuge supervisor, <i>retired</i>	USFWS
Wyoming Toad Recovery Team	Wyoming toad recovery	USFWS

# Appendix D

## *Public Involvement*

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Public scoping began June 16, 2006, with the publication of a notice of intent in the “Federal Register” to prepare comprehensive conservation plans and associated environmental documents for the three Laramie Plains refuges and announce opportunities for public input on refuge management.

In September 2006, a planning update was sent to each individual, organization, and government representative on the CCP mailing list (see list below). The planning update provided information about the history of the Refuge System and the CCP process, along with a mailing list consent form, comment form, and schedule of the planning process.

A public open house was held in Laramie, Wyoming, on May 25, 2006. The open house was announced in local newspapers and on radio and television stations. An overview of the CCP and NEPA processes was presented at the open house. Attendees were encouraged to ask questions and offer comments. Approximately 31 people attended the open house. In addition to the scoping meeting, postage-paid comment forms were sent to everyone on the mailing list.

During the scoping effort, 55 comments were received from the open house, letters, and comment forms. Comments identified biological, social, and economic concerns regarding refuge management. This input was used in the development of management alternatives considered in the draft CCP and EA, plus the goals, objectives, and strategies described for the proposed action.

A second planning update was distributed in August 2007. This update provided information about the ongoing public involvement effort and encouraged the public to provide comments on the draft CCP and EA.

The draft CCP and EA was presented to the public August 1, 2007, for a 30-day comment period. An open house was held August 29, 2007, in Laramie. Six people attended the open house and 29 people provided written comments during the comment period on the draft plan.

### **PUBLIC COMMENTS**

The following issues, concerns, and comments are a compilation and summary of those expressed during the August 2007 comment period for the draft CCP and EA. Comments were provided

by the public, federal and state agencies, local and county governments, private organizations, Service staff, and individuals concerned about the natural resources and public use of the Laramie Plains refuges. Comments were received orally at meetings, via email, fax, and in writing.

The issues, comments, and concerns are summarized, followed by responses from the Service. Where there were similar statements from more than one commentator, the statements were grouped into one summarized comment.

Comments about editorial and presentation corrections were addressed in the production of this final CCP and are not detailed here.

The refuge staff recognize and appreciate all input received from the public review period. To address this input, several clarifications and some changes are reflected in this final CCP.

### **Comments That Apply to All Laramie Plains Refuges**

**Comment 1:** Support proposed alternative of enhanced refuge management (alternative B). Advocate the Service maintain and enhance the diversity and habitat of native wildlife on each refuge. Consider other uses of the refuges as secondary to maintaining habitat for native wildlife.

**Response 1:** The proposed action (alternative B) was selected to ensure the wildlife and their habitats are protected, enhanced, and restored, so that future generations of Americans can continue to enjoy wildlife. The Service expects that, when the habitat goals are met, the results will be positive impacts to vegetation and wildlife.

The Improvement Act states that uses of national wildlife refuge must be appropriate. The 1997 Act also stipulated 6 wildlife-dependent uses that may occur on a refuge if they are deemed compatible and do not interfere with the refuges purpose.

**Comment 2:** Monitor and manage grazing, recreation, and utility lines to ensure compatibility with the purpose and mission of the refuges.

**Response 2:** Congress sets guiding principles for the management of public lands by federal agencies. While some federal agencies have multiple use mandates from Congress, the Service has a

specific mandate to put wildlife first. The Service is mandated to accommodate all other refuge uses only when compatible with conservation of wildlife resources and their habitats.

**Comment 3:** Manage water resources (i.e., work with the existing water rights to maximize quantity of water to the refuges and investigate possibilities to transfer rights from other lands to enhance irrigation within refuge lands) to provide the best possible habitat conditions for wildlife in anticipation of dry periods or global climate change.

**Response 3:** We agree. Greater quantity and stability of the water levels would benefit waterfowl, shorebirds, wading birds, and other wetland-dependent wildlife. The CCP includes objectives and strategies for increased water management and investigation of opportunities to acquire additional water rights where feasible.

**Comment 4:** Support increased management and oversight for the three Laramie Plains refuges. The recommended addition of a full-time staff member with duties specific to the Laramie Plains refuges will be essential to accomplish the goals listed under alternative B as well as discourage violations within the refuge. A staff member assigned to the Laramie Plains refuges should be stationed locally.

**Response 4:** The CCP includes a refuge operations goal with specific objectives and strategies to increase staffing and funding levels for the refuges. The duty station would be identified at the time approval is received to hire an employee.

**Comment 5:** Invasive weed infestation is a potential threat to biological diversity and environmental integrity. Effective monitoring is essential for early detection rapid response (EDRR), which is recognized by weed-control experts as an effective weed-management program. Local organizations would like to be an active partner in weed control at the refuges.

**Response 5:** Invasive species control is being conducted in cooperation with Albany County Weed and Pest on an annual basis. The refuge will continue to partner with Albany County Weed and Pest for monitoring and control of invasive species.

**Comment 6:** Buffer zones should be maintained and expanded wherever possible due to the small size of the refuge units. Proximity to Laramie and urban growth pose threats to the refuge units. Septic systems from private homes and businesses should not be allowed to affect the refuge units.

**Response 6:** The CCP includes objectives and strategies to provide additional land protection for the refuges where appropriate.

**Comment 7:** Retain protection of endangered and threatened species as the Service's highest management priority. Species known to live in the Laramie Plains region include the Preble's meadow jumping mouse and the Wyoming toad.

**Response 7:** The Service is mandated to protect threatened and endangered species, and the protection of threatened and endangered species will continue to be a management priority on the Laramie Plains refuges. A Section 7 Biological Evaluation will be completed as part of the CCP process and included in the document as appendix M.

**Comment 8:** Pathfinder NWR should be considered part of the Laramie Plains wetland complex and included in the Laramie Plains CCP and EA.

**Response 8:** The Improvement Act mandates a CCP be prepared for each unit of the Refuge System. The Service elected to prepare a separate CCP for Pathfinder NWR for a number of reasons, including the difference in geographic area, urban centers (Laramie versus Casper), partner agencies (WGF, Reclamation, BLM), stakeholders, planning issues and habitat types (natural wetlands versus open water/reservoir habitats) of the refuges.

**Comment 9:** Baseline data must be acquired, analyzed, evaluated and compared to existing conditions so that a historic range of variability can be established for species inhabiting each refuge. A survey of the refuges for sensitive wildlife and plant species needs to be completed, and until accomplished should remain a top priority.

**Response 9:** We agree. The CCP includes a research and science goal with specific objectives and strategies to acquire baseline data for the refuges.

**Comment 10:** Federal funding is steadily decreasing and the ability to fund additional projects or an FTE is unlikely. Partnerships can increase funding and manpower. Recruit graduate students to assist in project implementation, research, and education. Use range specialists from partner agencies to design and perform range monitoring transects, which will assist the Service in making a scientifically based perspective on how livestock are utilizing the vegetation on all three refuges. Encourage the inclusion of livestock producers as part of a range-monitoring process to strengthen relationships and develop long-term goals for the vegetation in the upland areas. Partnerships with other agencies will allow the Service to match funds and in-kind contributions contingent upon partnerships with local agencies and organizations.

**Response 10:** We agree. The CCP includes a partnership goal with specific objectives and strategies to increase partnerships to benefit the refuges.



**Comment 11:** Encourage the Service to include livestock producers and range specialists in the decision-making process for stocking rates on the refuges. Results of the previous grazing year should be published prior to changes in AUMs. The Service should provide at least one year notice of changes in AUM rates.

**Response 11:** The Service works with grazing permittees on an annual basis to manage grazing for habitat improvement. Grazing must be compatible with refuge purposes and managed for the benefit of wildlife. Information regarding the grazing program is public information and may be obtained by contacting the refuge. The Service will continue to provide adequate notice of changes in AUM rates at the refuges.

**Comment 12:** Encourage Service to work with livestock and range specialists to investigate using sheep and goats for invasive species management. Biological control of weeds and nonnative vegetation benefits the refuge by reducing and/or eliminating the use of chemicals.

**Response 12:** The Service will work with partners to investigate using sheep and goats for invasive species management as time and staffing permit.

**Comment 13:** Stocking of nonnative wildlife and fishes should not occur on the refuges. Game species (e.g., game fish) have great potential for altering the natural ecological balance of ponds and lakes, potentially threatening native fishes, amphibians, and other sensitive species.

**Response 13:** Stocking of nonnative wildlife does not occur on the refuges.

**Comment 14:** The presence of feral cats and dogs on refuge lands should be monitored and a program should be established for their humane removal.

**Response 14:** When observed, feral cats and dogs will be controlled humanely.

**Comment 15:** Pesticide use should be held to a minimum. Pesticides are known to affect amphibian reproduction and offspring development. Insecticides, rodenticides, fertilizers, and other widely applied contaminants should be prohibited on refuge lands, and their use on adjacent private lands should be analyzed to assess possible direct or cumulative impacts to species on the Laramie Plains refuges.

**Response 15:** Integrated pest management guidelines are followed for invasive species control. Chemical, mechanical and biological controls are utilized as appropriate on refuge lands.

**Comment 16:** Designate Laramie Plains refuge lands as exclusion zones for oil and gas development.

**Response 16:** The Service does not own the mineral rights for the refuges and may not preclude oil and gas development on the refuges. The Service can minimize surface impacts when mineral rights are privately owned.

**Comment 17:** Vehicle use on refuge lands should be confined to designated roads, and new road construction should not be permitted. Gravel roads contribute to siltation in streams and downstream wetlands and lakes.

**Response 17:** Bamforth NWR and Mortenson Lake NWR are closed to public use. A visitor services management plan for Hutton Lake NWR will be developed with implementation of the CCP that will address circulation and roads. Visitor facilities will be accessible and designed to minimize impacts to wildlife.

**Comment 18:** Visitor facilities should be designed to minimize physical and visual impacts to the natural setting and to maintain or improve the health and function of the refuge's ecosystem. Concentrate visitor use to existing hardened sites.

Accessible facilities should be provided on at least one of the refuges.

**Response 18:** See response to comment #17.

**Comment 19:** Manage hunting to maximize safety of hunters, nearby landowners, and refuge visitors.

**Response 19:** All three of the Laramie Plains refuges are closed to hunting and shooting.

**Comment 20:** Hunting should be banned on the refuges because it is a violent act that promotes additional violence.

**Response 20:** See response to comment #19.

**Comment 21:** Wildlife watching outspends all other uses and is the prime reason for refuges and needs first priority.

**Response 21:** Wildlife observation is one of the six priority wildlife-dependent recreational uses, along with hunting, fishing, wildlife photography, environmental education, and interpretation.

## Comments That Apply to Bamforth NWR

**Comment 22:** We agree that research is needed at Bamforth NWR, and support the recommendation to conduct research and partner with others to

obtain a good understanding of the role and value of Bamforth NWR in the Laramie Basin wetland ecosystem. Given the value of wetlands generally, the refuge may possess significant wildlife values.

**Response 22:** The CCP includes a research goal with specific objectives and strategies to obtain baseline data for Bamforth NWR.

**Comment 23:** The CCP lacks reference to studies on Bamforth NWR documenting the long-term importance of the refuge to colonial nesting birds (e.g., studies by Diem, Pugsek, Nations, and others). Believe that habitats at the refuge are of significant importance to justify retention without further investigation.

**Response 23:** With implementation of the CCP and additional staff and partnerships more information will be gathered and evaluated to guide future management decisions at Bamforth NWR.

**Comment 24:** Bamforth NWR should not be eliminated from the Refuge System. Oppose any future effort to sell or otherwise relinquish Bamforth NWR.

**Response 24:** Divestiture of the refuge was considered but eliminated as an option in the CCP planning process. Bamforth NWR will be retained in the Refuge System for the next 15 years, and biological information will be obtained to guide future management decisions. A detailed and objective account can be found in appendix D of the draft CCP.

**Comment 25:** Bamforth NWR supports some of the largest white pelican and California gull populations in this region, as well as large shorebird populations.

**Response 25:** While Bamforth Lake supports white pelican and California gull populations, the island that provides nesting habitat is located outside the refuge boundary. The Service has no jurisdiction or management capability for the island.

## Comments That Apply to Hutton Lake NWR

**Comment 26:** The effects of low-priority water rights at Hutton Lake NWR have been observed in recent years when the lakes were dry and there was virtually no habitat for nesting or migrating birds. The Service should strengthen the language on seeking to obtain or transfer additional water rights for the refuges as well as better claim current rights.

**Response 26:** See response to comment #3.

**Comment 27:** Include provisions for prohibiting motorized vehicle incursions into sensitive habitats (within 3 miles of a sage-grouse lek or 1 mile of a raptor nest during the breeding/nesting season, or within crucial big-game winter range during its season of use). Temporary vehicle closures provide undisturbed habitat for wildlife.

**Response 27:** A step-down visitor services management plan will be developed for the refuge that will address permanent and/or temporary road closures to benefit migratory birds and other wildlife.

**Comment 28:** An increase in motor vehicle use has been observed in and around Hutton Lake NWR over the last 5 years. A road has been created along the boundary fence-line to the south and east.

Citizens have observed the shooting of prairie dogs on the refuge from the boundary, and an ATV on the refuge attempting to drive antelope outside to waiting hunters.

A more developed infrastructure for wildlife observation and education, with more public presence for those purposes, and a greater law enforcement presence would be helpful in reducing illegal use of the refuge.

**Response 28:** See response to comment #27.

**Comment 29:** Seeking additional protective tenure for the land west of Hutton Lake NWR, as stated in the proposed alternative, would increase the value of this refuge for waterfowl and waterbirds. Have observed 50 black-crowned night-herons using the wetlands directly west of the refuge.

**Response 29:** We agree. The CCP includes objectives and strategies to seek protective land-tenure status for the land west of Hutton Lake NWR.

**Comment 30:** The white-tailed prairie dog colony on the refuge should be allowed to thrive and expand. Rodenticides used to poison white-tailed prairie dogs should be prohibited on the refuge. Prairie dogs are a well-known keystone species. The burrowing owl, black-footed ferret, swift fox, mountain plover, ferruginous hawk, and other species are negatively affected by poisons sequestered in poisoned prairie dog carcasses.

**Response 30:** Prairie dog control does not occur on the refuge. The colony will be allowed to expand on refuge lands.

**Comment 31:** Oppose alternative B (proposed action) due to discontinuation of grazing at Hutton Lake NWR. Removal of special use permit will weaken

the Service's ability to manage vegetation without mechanical or chemical methods and weaken relationships with neighboring ranchers.

**Response 31:** The Service does not intend to eliminate grazing on the refuge. The text in the final CCP was revised to clarify the Service's intention to evaluate the grazing program and manage grazing on the refuge to support refuge purposes, goals, and objectives.

## Comments That Apply to Mortenson Lake NWR

**Comment 32:** Provide maximum protection to the Wyoming toad. Support introduction of the toad to other refuges if recommended by the recovery team.

Manage upland grazing around Mortenson Lake in a manner fully compatible with Wyoming toad protection efforts. Use fencing as a means to protect Mortenson Lake shore from grazing impacts. Limit public use to give the toad maximum chance of recovery.

**Response 32:** All management actions on the refuge are evaluated and conducted with concurrence of the Wyoming Toad Recovery Team. As future research and knowledge of Wyoming toad biology improves, management will continue to benefit the Wyoming toad. The refuge will remain closed to public use until the population recovery goals for the Wyoming toad have been met.

**Comment 33:** Consider opening the refuge as a Hunter Management Area for pronghorn. Concerned about the effects of wild and domestic ungulate herbivory on habitat quality. Controlled hunting may address habitat issues on the refuge and contains numerous mechanisms for regulating harvest while avoiding Wyoming toad habitat. Many private lands surrounding the refuge receive light harvest pressure.

**Response 33:** The refuge is mandated to manage for endangered species, specifically the Wyoming toad. Hunting is a secondary use. Improving and increasing the acres of habitat for the Wyoming toad will take priority.

**Comment 34:** If during the time frame of this plan (2007–22) other sites have established viable Wyoming toad populations, recommend revisiting the possibility of allowing some form of public access for fishing.

**Response 34:** The refuge will remain closed to public use until the population recovery goals for the Wyoming toad have been met.

## Federal Officials

U.S. Representative Barbara Cubin, Washington DC

Rep. Cubin's Area Director, Cheyenne, WY

U.S. Senator Craig Thomas, Washington DC

Sen. Thomas's Area Director, Casper, WY

U.S. Senator Michael Enzi, Washington DC

Sen. Enzi's Area Director, Cheyenne, WY

## Federal Agencies

Bureau of Land Management; Cheyenne, WY; Rawlins, WY

National Park Service, Omaha, NE

USFWS, Ecological Services, Cheyenne, WY

USFWS, National Wildlife Refuge System; Albuquerque, NM; Anchorage, AK; Arlington, VA; Atlanta, GA; Fort Snelling, MN; Hadley, MA; Portland, OR; Rawlins, WY; Sacramento, CA; Shepherdstown, WV; Washington DC

USGS—Fort Collins Science Center, Ft. Collins, CO

## Tribal Officials

Arapaho Business Committee, Fort Washakie, WY

Crow Tribal Council, Crow Agency, MT

Northern Cheyenne Tribal Council, Lame Deer, MT

Oglala Sioux Tribal Council, Pine Ridge, SD

Shoshone Business Council, Fort Washakie, WY

## State Officials

Governor Dave Freudenthal, Cheyenne

Representative Kermit Brown, Laramie

Representative Kurt S. Bucholz, Saratoga

Representative Jim Slater, Laramie

Representative Jane Warren, Laramie

Representative Kevin White, Laramie

Senator Mike Massie, Laramie

Senator Phil Nicholas, Laramie

## State Agencies

Wyoming Department of Agriculture, Cheyenne

Wyoming Game and Fish Department; Casper; Lander; Laramie

Wyoming Game Fish Commission, Cheyenne

Wyoming Office of State Lands and Investments,  
Cheyenne

Wyoming State Historic Preservation Office,  
Cheyenne

## Local Government

Albany County Commissioners, Laramie

Laramie Rivers Conservation District, Safe Harbor  
Liaison, Laramie

Mayor, Laramie

## Organizations

American Bird Conservancy, Plains, VA

American Rivers, Washington DC

Audubon Wyoming, Casper, WY; Laramie, WY; Tie  
Siding, WY

Biodiversity Conservation Alliance, Laramie, WY

Defenders of Wildlife, Washington DC

Ducks Unlimited, Memphis, TN

Izaak Walton League, Gaithersburg, MD

League of Women Voters of Wyoming, Laramie, WY

Murie Audubon Society, Casper, WY

National Audubon Society; Washington DC; New  
York, NY

National Trappers Association, New Martinsville,  
WV

National Wildlife Federation, Reston, VA

National Wildlife Refuge Association, Washington DC

Sierra Club; San Francisco, CA; Sheridan, WY

The Nature Conservancy, Boulder, CO

The U.S. Humane Society, Washington, DC

The Wilderness Society, Washington DC

Union Pacific Railroad, Omaha, NE

Wildlife Management Institute; Fort Collins, CO;  
Corvallis, OR; Washington DC

Wyoming Natural diversity Database, Laramie, WY

Wyoming Outdoor Council, Logan, UT

## State Universities, Colleges, and Schools

University of Wyoming, Real Estate Operations,  
Laramie

University of Wyoming, School of Environment and  
Natural Resources, Laramie

## Local Media

Casper Star Tribune, Casper

Daily Boomerang, Laramie

KCGY, Laramie

KIMX, Laramie

KISS, Casper

KKTY, Douglas

Rawlins Daily Times, Rawlins

Wyoming Public Radio, Laramie

## Individuals

71 individuals



# Appendix E

## *Fire Management Program*

The Service has management and administrative responsibility, including fire management, for the Laramie Plains refuges, which covers approximately 4,860 acres in south-central Wyoming.

### THE ROLE OF FIRE

In ecosystems of the Great Plains, vegetation has evolved under periodic disturbance and defoliation from grazing, fire, drought, and floods. This periodic disturbance is what kept the ecosystem diverse and healthy while maintaining significant biodiversity for thousands of years.

Historically, natural fire and Native American ignitions have played an important disturbance role in many ecosystems by removing fuel accumulations, decreasing the impacts of insects and diseases, stimulating regeneration, cycling nutrients, and providing a diversity of habitats for plants and wildlife.

When fire and/or grazing are excluded from prairie landscapes, fuel loadings increase due to a build-up of thatch and invasion of woody vegetation. This increase in fuel loadings leads to an increase in a fire's resistance to control, which threatens firefighter and public safety as well as federal and private facilities.

However, when properly utilized, fire can

- reduce hazardous fuels build-up in both wildland-urban interface (WUI) and non-WUI areas;
- improve wildlife habitats by reducing density of vegetation and/or changing plant species composition;
- sustain and/or increase biological diversity;
- improve woodlands and shrub lands by reducing plant density;
- reduce susceptibility of plants to insect and disease outbreaks;
- improve quality and quantity of livestock forage;
- improve the quantity of water available for municipalities and activities dependent on wildlands for their water supply.

### WILDLAND FIRE MANAGEMENT POLICY AND GUIDANCE

In 2001, an update of the 1995 "Federal Fire Policy" was completed and approved by the Secretaries of Interior and Agriculture. The 2001 "Federal Wildland Fire Management Policy" directs federal agencies to achieve a balance between fire suppression to protect life, property, and resources and fire use to regulate fuels and maintain healthy ecosystems. In addition, it directs agencies to use the appropriate management response for all wildland fire regardless of the ignition source. This policy provides eight guiding principles that are fundamental to the success of the fire management program:

- Firefighter and public safety is the first priority in every fire management activity.
- The role of wildland fires as an ecological process and natural change agent will be incorporated into the planning process.
- Fire management plans (FMPs), programs, and activities support land and resource management plans and their implementation.
- Sound risk management is a foundation for all fire management activities.
- Fire management programs and activities are economically viable, based on values to be protected, costs, and land and resource management objectives.
- FMPs and activities are based on the best available science.
- FMPs and activities incorporate public health and environmental quality consideration.
- Federal, state, tribal, local, interagency, and international coordination and cooperation are essential.
- Standardization of policies and procedures among federal agencies is an ongoing objective.

The fire management considerations, guidance, and direction should be addressed in the land use resource plans (for example, the CCP). FMPs are

step-down processes from the land use plans and habitat plans, with more detail on fire suppression, fire use, and fire management activities.

## MANAGEMENT DIRECTION

The Laramie Plains refuges will protect life, property, and other resources from wildland fire by safely suppressing all wildfires. Prescribed fire as well as manual and mechanical fuel treatments will be used in an ecosystem context to protect both federal and private property and for habitat management purposes. Fuel reduction activities will be applied in collaboration with federal, state, private, and NGO partners. In addition, fuel treatments will be prioritized based on the guidance for prioritization established in the goals and strategies outlined in the U.S. Fish and Wildlife Service's National Wildlife Refuge System Wildland Fire Management Program Strategic Plan 2003–2010 and the R6 Refuges Regional Priorities FY07–11. For WUI treatments, areas with community wildfire protection plans and communities at risk will be the primary focus.

All aspects of the fire management program will be conducted in a manner consistent with applicable laws, policies, and regulations. The Laramie Plains refuge stations will maintain an FMP to accomplish the fire management goals described below. Prescribed fire, manual, and mechanical fuel treatments will be applied in a scientific way under selected weather and environmental conditions.

## Fire Management Goals

The goals and strategies of the U.S. Fish and Wildlife Service's National Wildlife Refuge System Wildland Fire Management Program Strategic Plan are consistent with Department and Service policies, National Fire Plan direction, President Bush's Healthy Forest Initiative, the 10-Year Comprehensive Strategy and Implementation Plan, National Wildfire Coordinating Group (NWCG) Guidelines, initiatives of the Wildland Fire Leadership Council, and Interagency Standards for Fire and Aviation Operations.

The R6 Refuges Regional Priorities FY07–11 are consistent with the refuges' vision statement for region 6: "to maintain and improve the biological integrity of the region, ensure the ecological condition of the region's public and private lands are better understood, and endorse sustainable use of habitats that support native wildlife and people's livelihoods." The fire management goals for the Laramie Plains refuges are to use prescribed fire,

manual, and mechanical treatments to: (1) reduce the threat to life and property through hazardous fuels reduction treatments, (2) meet the habitat goals and objectives identified in this CCP, and (3) reintroduce fire to ecosystems that evolved with fire as a disturbance factor.

## Fire Management Objective

The objective of the fire management program is to utilize prescribed fire, manual, and mechanical treatment methods to treat between 10 and 500 acres over the life of the plan.

## Strategies

Strategies and tactics that consider public and firefighter safety as well as resource values at risk will be used. Wildland fire suppression, prescribed fire methods, manual and mechanical means, timing, and monitoring are described in more detail within the step-down FMP(s).

All management actions would use prescribed fire, manual and/or mechanical means to reduce hazardous fuels, restore and maintain desired habitat conditions, control nonnative vegetation, and control the spread of woody vegetation within the diverse ecosystem habitats. The fuels treatment program will be outlined in the FMP for the refuges. Site-specific prescribed fire burn plans will be developed following the Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide (2006) template.

Prescribed fire temporarily reduces air quality by reducing visibility and releasing components through combustion. The refuges will meet the Clean Air Act emission standards by adhering to the Wyoming State Implementation Plan requirements during all prescribed fire activities.

## FIRE MANAGEMENT ORGANIZATION, CONTACTS, AND COOPERATION

Qualified fire management technical oversight for the refuges will be established by region 6 of the Service, using the fire management district approach. Under this approach, fire management staff will be determined by established modeling systems based on the fire management workload of a group of refuges, and possibly that of interagency partners. The fire management workload consists of historical wildland fire suppression activities as well as historical and planned fuels treatments.

Depending on budgets, fire management staffing and support equipment may be located at the administrative station or at other refuges within the district and shared between all units. Fire management activities will be conducted in a coordinated and collaborative manner with federal and nonfederal partners.

As part of this CCP, new FMP(s) will be developed for the Laramie Plains refuges. The FMP(s) may be done as: (1) an FMP that covers each individual refuge, (2) an FMP that covers the refuges within this CCP, (3) an FMP that covers the administrative district, or (4) an interagency FMP.





# Appendix F

## List of Plant Species

The following plant species that occur at the Laramie Plains refuges are listed in alphabetic order of their scientific names. Species may be found on one or more of the three refuges.

Scientific Name	Common Name
<i>Achillea millefolium</i>	Common yarrow
<i>Achnatherum hymenoides</i>	Indian ricegrass
<i>Agoseris glauca</i>	Mountain dandelion
<i>Agropyron cristatum</i>	Crested wheatgrass
<i>Agrostis stolonifera</i>	Creeping bentgrass
<i>Alopecurus arundinaceus</i>	Creeping meadow foxtail
<i>Antennaria microphylla</i>	Littleleaf pussytoes
<i>Argentina anserina</i>	Silverweed cinquefoil
<i>Artemisia frigida</i>	Fringed sage
<i>Artemisia tridentata wyomingensis</i>	Wyoming big sagebrush
<i>Artemisia tridentata vaseyana</i>	Mountain big sagebrush
<i>Aster ascendens</i>	Western aster
<i>Aster falcatus</i>	White prairie aster
<i>Astragalus agrestis</i>	Field milkvetch
<i>Astragalus bodinii</i>	Bodin's milkvetch
<i>Astragalus</i> spp.	Milkvetch
<i>Atriplex gardneri</i>	Gardner's saltbush
<i>Bouteloua gracilis</i>	Blue grama
<i>Brassicaceae</i> spp.	Mustard
<i>Bromus tectorum</i>	Cheatgrass
<i>Calamagrostis stricta</i>	Reedgrass
<i>Camelina microcarpa</i>	Littlepod false flax
<i>Carex nebrascensis</i>	Nebraska sedge
<i>Carex praegracilis</i>	Clustered field sedge
<i>Chenopodium rubrum</i>	Red goosefoot
<i>Chrysothamnus</i> spp.	Rabbitbrush
<i>Cirsium arvense</i>	Canada thistle
<i>Cirsium canescens</i>	Prairie thistle
<i>Cleome serrulata</i>	Rocky mountain bee plant
<i>Conyza canadensis</i>	Canadian horseweed
<i>Crepis runcinata</i>	Hawk's beard
<i>Cryptantha</i> spp.	Cryptantha
<i>Cryptantha thyrsiflora</i>	Calcareous cryptantha
<i>Delphinium geyeri</i>	Geyer's larkspur
<i>Deschampsia caespitosa</i>	Tufted hairgrass
<i>Descurainia sophia</i>	Flixweed

Scientific Name	Common Name
<i>Distichlis spicata</i>	Saltgrass
<i>Elymus triticoides</i>	Alkali wildrye
<i>Eleocharis fallax</i>	Creeping spikerush
<i>Eleocharis</i> spp.	Spikerush
<i>Elymus lanceolatus</i>	Thickspike wheatgrass
<i>Elymus</i> spp.	Wheatgrass
<i>Elymus trachycaulus</i>	Slender wheatgrass
<i>Epilobium ciliatum</i>	Fringed willowherb
<i>Equisetum laevigatum</i>	Smooth horsetail
<i>Erigeron</i> spp.	Fleabane
<i>Eriogonum brevicaule</i>	Shortstem buckwheat
<i>Eriogonum flavum</i>	Alpine golden buckwheat
<i>Eriogonum ovalifolium</i>	Cushion buckwheat
<i>Eriogonum</i> spp.	Buckwheat
<i>Erysimum capitatum</i>	Sanddune wallflower
<i>Erysimum</i> spp.	Wallflower
<i>Festuca</i> spp.	Fescue
<i>Gentianella amarella</i>	Autumn dwarf gentian
<i>Glaux maritima</i>	Sea milkwort
<i>Grindelia squarrosa</i>	Curlycup gumweed
<i>Gutierrezia sarothrae</i>	Broom snakeweed
<i>Hesperostipa comata</i>	Needleandthread
<i>Heterotheca subaxillaris</i>	Camphorweed
<i>Hippuris vulgaris</i>	Common mare's-tail
<i>Hordeum jubatum</i>	Foxtail barley
<i>Iris missouriensis</i>	Rocky Mountain iris
<i>Juncus balticus</i>	Baltic rush
<i>Juncus bufonius</i>	Toad rush
<i>Juncus compressus</i>	Roundfruit rush
<i>Juncus longistylis</i>	Longstyle rush
<i>Juncus nevadensis</i>	Sierra rush
<i>Juncus torreyi</i>	Torrey's rush
<i>Koeleria macrantha</i>	Prairie Junegrass
<i>Krascheninnikovia lanata</i>	Winterfat
<i>Lappula</i> spp.	Stickseed
<i>Lepidium densiflorum</i>	Common pepperweed
<i>Lepidium perfoliatum</i>	Clasping pepperweed
<i>Lepidium</i> spp.	Pepperweed
<i>Linanthus pungens</i>	Granite prickly phlox
<i>Lesquerella ludoviciana</i>	Foothill bladderpod

Scientific Name	Common Name
<i>Lesquerella</i> spp.	Bladderpod
<i>Lygodesmia juncea</i>	Rush skeletonplant
<i>Melilotus officinalis</i>	Yellow sweetclover
<i>Melilotus</i> spp.	Sweetclover
<i>Mentha arvensis</i>	Wild mint
<i>Mertensia</i> spp.	Bluebells
<i>Mimulus glabratus</i>	Roundleaf monkeyflower
<i>Mirabilis linearis</i>	Narrowleaf four o'clock
<i>Muhlenbergia filiformis</i>	Pullup muhly
<i>Oenothera coronopifolia</i>	Crownleaf evening primrose
<i>Opuntia</i> spp.	Pricklypear
<i>Orobanche fasciculata</i>	Clustered broomrape
<i>Orobanche ludoviciana</i>	Louisiana broomrape
<i>Oxytropis deflexa</i>	Nodding locoweed
<i>Oxytropis</i> spp.	Locoweed
<i>Parnassia palustris</i>	Marsh grass of Parnassus
<i>Paronychia sessiliflora</i>	Creeping nailwort
<i>Pascopyrum smithii</i>	Western wheatgrass
<i>Phleum pratense</i>	Timothy
<i>Phlox hoodii</i>	Hood's phlox
<i>Physaria</i> spp.	Twinpod
<i>Plantago eriopoda</i>	Redwool plantain
<i>Poa juncifolia</i>	Sandberg bluegrass
<i>Poa pratensis</i>	Kentucky bluegrass
<i>Poa</i> spp.	Bluegrass
<i>Poa trivialis</i>	Rough bluegrass
<i>Polygonum aviculare</i>	Prostrate knotweed
<i>Polygonum ramosissimum</i>	Bushy knotweed
<i>Potentilla bipinnatifida</i>	Tansy cinquefoil
<i>Potentilla</i> spp.	Cinquefoil
<i>Primula incana</i>	Silvery primrose
<i>Pseudoroegneria spicata</i>	Bluebunch wheatgrass
<i>Puccinellia nuttalliana</i>	Nuttall's alkaligrass
<i>Pyrrocoma lanceolata</i>	Lanceleaf goldenweed
<i>Ranunculus cymbalaria</i>	Alkali buttercup
<i>Rumex crispus</i>	Curly dock
<i>Rumex maritimus</i>	Golden dock
<i>Salix plantifolia</i>	Planeleaf willow
<i>Salsola kali</i>	Russian thistle

Scientific Name	Common Name
<i>Salsola collina</i>	Slender Russian thistle
<i>Salsola</i> spp.	Russian thistle
<i>Sarcobatus vermiculatus</i>	Greasewood
<i>Scirpus americanus</i>	American bulrush
<i>Scirpus nevadensis</i>	Nevada bulrush
<i>Schoenoplectus tabernaemontani</i>	Softstem bulrush
<i>Scutellaria galericulata</i>	Marsh skullcap
<i>Senecio hydrophiloides</i>	Tall groundsel
<i>Sisyrinchium implicatum</i>	Blueeyed grass
<i>Sisyrinchium pallidum</i>	Pale blue-eyed grass
<i>Sium suave</i>	Hemlock waterparsnip
<i>Sonchus palustris</i>	Marsh sowthistle
<i>Sparganium</i> spp.	Bur-reed
<i>Sphaeralcea coccinea</i>	Scarlet globemallow
<i>Sporobolus cryptandrus</i>	Sand dropseed
<i>Stuckenia filiformis</i>	Fineleaf pondweed
<i>Stuckenia pectinata</i>	Sago pondweed
<i>Tetradymia canescens</i>	Spineless horsebrush
<i>Townsendia hookeri</i>	Hooker's townsendia
<i>Tragopogon dubius</i>	Yellow salsify
<i>Trifolium hybridum</i>	Alsike clover
<i>Trifolium repens</i>	White clover
<i>Triglochin maritima</i>	Seaside arrowgrass
<i>Triglochin palustris</i>	Marsh arrowgrass
<i>Valeriana edulis</i>	Tobacco root



# Appendix G

## List of Potentially Occurring Bird Species

The following bird species potentially occur at the Laramie Plains refuges. Species may be found on one or more of the three refuges.

Scientific Name	Common Name
<i>Accipiter cooperii</i>	Cooper's hawk
<i>Accipiter gentilis</i>	Northern goshawk*
<i>Accipiter striatus</i>	Sharp-shinned hawk*
<i>Actitis macularia</i>	Spotted sandpiper
<i>Aechmophorus clarkii</i>	Clark's grebe
<i>Aechmophorus occidentalis</i>	Western grebe
<i>Agelaius phoeniceus</i>	Red-winged blackbird
<i>Aix sponsa</i>	Wood duck
<i>Anas acuta</i>	Northern pintail
<i>Anas americana</i>	American wigeon
<i>Anas carolinensis</i>	Green-winged teal
<i>Anas clypeata</i>	Northern shoveler
<i>Anas cyanoptera</i>	Cinnamon teal
<i>Anas discors</i>	Blue-winged teal
<i>Anas platyrhynchos</i>	Mallard
<i>Anas strepera</i>	Gadwall
<i>Anthus rubescens</i>	American pipit
<i>Aquila chrysaetos</i>	Golden eagle
<i>Ardea herodias</i>	Great blue heron
<i>Asio flammeus</i>	Short-eared owl*
<i>Athene cunicularia</i>	Burrowing owl*
<i>Aythya affinis</i>	Lesser scaup
<i>Aythya americana</i>	Redhead
<i>Aythya collaris</i>	Ring-necked duck
<i>Aythya marila</i>	Greater scaup*
<i>Aythya valisineria</i>	Canvasback
<i>Bombycilla cedrorum</i>	Cedar waxwing*
<i>Bombycilla garrulus</i>	Bohemian waxwing*
<i>Botaurus lentiginosus</i>	American bittern
<i>Branta canadensis</i>	Canada goose
<i>Bubo virginianus</i>	Great horned owl*
<i>Bubulcus ibis</i>	Cattle egret
<i>Bucephala albeola</i>	Bufflehead
<i>Bucephala clangula</i>	Common goldeneye
<i>Bucephala islandica</i>	Barrow's goldeneye*

Scientific Name	Common Name
<i>Buteo jamaicensis</i>	Red-tailed hawk
<i>Buteo lagopus</i>	Rough-legged hawk
<i>Buteo regalis</i>	Ferruginous hawk
<i>Buteo swainsoni</i>	Swainson's hawk
<i>Butorides virescens</i>	Green heron*
<i>Calamospiza melanocorys</i>	Lark bunting
<i>Calcarius ornatus</i>	Chestnut-collared longspur
<i>Calcarius sandwichensis</i>	McGown's longspur
<i>Calidris alba</i>	Sanderling*
<i>Carduelis pinus</i>	Pine siskin
<i>Carduelis tristis</i>	American goldfinch
<i>Cathartes aura</i>	Turkey vulture
<i>Catharus guttatus</i>	Hermit thrush*
<i>Charadrius montanus</i>	Mountain plover*
<i>Charadrius vociferus</i>	Killdeer
<i>Chen caerulescens</i>	Snow goose*
<i>Chen rossii</i>	Ross's goose*
<i>Chlidonias niger</i>	Black tern
<i>Chondestes grammacus</i>	Lark sparrow
<i>Chordeiles minor</i>	Common nighthawk
<i>Circus cyaneus</i>	Northern harrier
<i>Cistothorus palustris</i>	Marsh wren
<i>Coccothraustes vespertinus</i>	Evening grosbeak*
<i>Colaptes auratus</i>	Northern flicker
<i>Corvus brachyrhynchos</i>	American crow
<i>Corvus corax</i>	Common raven
<i>Cygnus columbianus</i>	Tundra swan
<i>Dendroica coronata</i>	Yellow rumped warbler
<i>Dendroica nigrescens</i>	Black-throated gray warbler*
<i>Dendroica petechia</i>	Yellow warbler
<i>Egretta thula</i>	Snowy egret
<i>Eremophila alpestris</i>	Horned lark
<i>Erolia alpina</i>	Dunlin*
<i>Erolia bairdii</i>	Baird's sandpiper
<i>Erolia mauri</i>	Western sandpiper
<i>Erolia minutilla</i>	Least sandpiper
<i>Euphagus carolinus</i>	Rusty blackbird*
<i>Euphagus cyanocephalus</i>	Brewer's blackbird
<i>Falco mexicanus</i>	Prairie falcon
<i>Falco peregrinus</i>	Peregrine falcon

Scientific Name	Common Name
<i>Fulica americana</i>	American coot
<i>Gallinago delicata</i>	Wilson's snipe
<i>Gavia immer</i>	Common loon
<i>Geothlypis trichas</i>	Common yellowthroat
<i>Grus canadensis tabida</i>	Sandhill crane
<i>Haliaeetus leucocephalus</i>	Bald eagle
<i>Himantopus mexicanus</i>	Black-necked stilt*
<i>Hirundo rustica</i>	Barn swallow
<i>Hydroprogne caspia</i>	Caspian tern*
<i>Larus argentatus</i>	Herring gull*
<i>Larus californicus</i>	California gull
<i>Larus delawarensis</i>	Ring-billed gull*
<i>Larus philadelphia</i>	Bonaparte's gull
<i>Larus pipixcan</i>	Franklin's gull
<i>Lanius ludovicianus</i>	Loggerhead shrike
<i>Leucosticte atrata</i>	Black rosy finch
<i>Leucosticte australis</i>	Brown-capped rosy finch*
<i>Leucosticte tephrocotis</i>	Gray-crowned rosy finch*
<i>Limnodromus scolopaceus</i>	Long-billed dowitcher
<i>Limosa fedoa</i>	Marbled godwit
<i>Lophodytes cucullatus</i>	Hooded merganser*
<i>Melanitta deglandi</i>	White-winged scoter*
<i>Melospiza melodia</i>	Song sparrow
<i>Mergus merganser</i>	Common merganser
<i>Micropalmata himantopus</i>	Stilt sandpiper*
<i>Molothrus ater</i>	Brown-headed cowbird
<i>Numenius americanus</i>	Long-billed curlew*
<i>Numenius phaeopus</i>	Whimbrel*
<i>Nycticorax nycticorax</i>	Black-crowned night-heron
<i>Oreoscoptes montanus</i>	Sage thrasher
<i>Oxyura jamaicensis</i>	Ruddy duck
<i>Passer domesticus</i>	House sparrow
<i>Passerculus sandwichensis</i>	Savannah sparrow
<i>Pelecanus erythrorhynchos</i>	American white pelican
<i>Petrochelidon pyrrhonota</i>	Cliff swallow
<i>Phalacrocorax auritus</i>	Double-crested cormorant
<i>Phalaropus lobatus</i>	Red-necked phalarope
<i>Phalaropus tricolor</i>	Wilson's phalarope
<i>Pica hudsonia</i>	Black-billed magpie
<i>Pipilo chlorurus</i>	Green-tailed towhee

Scientific Name	Common Name
<i>Piranga ludoviciana</i>	Western tanager
<i>Plectrophenax nivalis</i>	Snow bunting*
<i>Plegadis chihi</i>	White-faced ibis
<i>Podiceps auritus</i>	Horned grebe*
<i>Podiceps grisegena</i>	Red-necked grebe*
<i>Podiceps nigricollis</i>	Eared grebe
<i>Podilymbus podiceps</i>	Pied-billed grebe
<i>Poecile atricapilla</i>	Black-capped chickadee
<i>Poocetes gramineus</i>	Vesper sparrow
<i>Porzana carolina</i>	Sora
<i>Quiscalus quiscula</i>	Common grackle
<i>Rallus limicola</i>	Virginia rail
<i>Recurvirostra americana</i>	American avocet
<i>Riparia riparia</i>	Bank swallow
<i>Salpinctes obsoletus</i>	Rock wren*
<i>Sayornis saya</i>	Say's phoebe
<i>Selasphorus platycercus</i>	Broad-tailed hummingbird
<i>Selasphorus rufus</i>	Rufous hummingbird
<i>Sialia currucoides</i>	Mountain bluebird
<i>Spizella breweri</i>	Brewer's sparrow
<i>Spizella passerina</i>	Chipping sparrow
<i>Stelgidopteryx serripennis</i>	Northern rough-winged swallow
<i>Sterna forsteri</i>	Forster's tern
<i>Sterna hirundo</i>	Common tern*
<i>Sturnus vulgaris</i>	European starling
<i>Sturnella magna</i>	Eastern meadowlark*
<i>Sturnella neglecta</i>	Western meadowlark
<i>Tachycineta bicolor</i>	Tree swallow
<i>Tachycineta thalassina</i>	Violet-green swallow
<i>Toxostoma rufum</i>	Brown thrasher
<i>Tringa flavipes</i>	Lesser yellowlegs
<i>Tringa melanoleuca</i>	Greater yellowlegs
<i>Tringa semipalmata</i>	Willet
<i>Tringa solitaria</i>	Solitary sandpiper
<i>Troglodytes aedon</i>	House wren*
<i>Turdus migratorius</i>	American robin
<i>Tyrannus tyrannus</i>	Eastern kingbird
<i>Tyrannus verticalis</i>	Western kingbird
<i>Xanthocephalus xanthocephalus</i>	Yellow-headed blackbird
<i>Zenaida macroura</i>	Mourning dove*
<i>Zonotrichia leucophrys</i>	White-crowned sparrow

\*Rare sighting.



# Appendix H

## *List of Potentially Occurring Amphibian and Reptile Species*

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The following amphibian and reptile species potentially occur at the Laramie Plains refuges. Species may be found on one or more of the three refuges.

Scientific Name	Common Name
<b>Amphibians</b>	
<i>Ambystoma tigrinum</i>	Tiger salamander
<i>Bufo baxteri</i>	Wyoming toad
<i>Phrynosoma platyrhinos</i>	Horned lizard
<i>Pseudacris triseriata maculata</i>	Boreal chorus frog
<i>Rana pipens</i>	Northern leopard frog
<b>Reptiles</b>	
<i>Crotalus viridis</i>	Prairie rattlesnake
<i>Pituophis catenifer</i>	Bull snake



# Appendix I

## *List of Potentially Occurring Mammal Species*

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The following mammals potentially occur at the Laramie Plains refuges. Species may be found on one or more of the three refuges.

Scientific Name	Common Name
<i>Antilocapra americana</i>	Pronghorn
<i>Canis latrans</i>	Coyote
<i>Cervus canadensis</i>	Elk
<i>Chaetodipus hispidus</i>	Hispid pocket mouse
<i>Cynomys leucurus</i>	White-tailed prairie dog
<i>Lepus townsendii</i>	White-tailed jack rabbit
<i>Mephitis mephitis</i>	Striped skunk
<i>Microtus pennsylvanicus</i>	Meadow vole
<i>Mustela frenata</i>	Long-tailed weasel
<i>Mustela vison</i>	Mink
<i>Myotis lucifugus</i>	Little brown myotis
<i>Odocoileus hemionus</i>	Mule deer
<i>Ondatra zibethicus</i>	Muskrat
<i>Perognathus fasciatus</i>	Wyoming pocket mouse
<i>Peromyscus maniculatus</i>	Deer mouse
<i>Procyon lotor</i>	Common raccoon
<i>Reithrodontomys megalotis</i>	Western harvest mouse
<i>Sorex cinereus</i>	Masked shrew
<i>Spermophilus elegans</i>	Wyoming ground squirrel
<i>Spermophilus tridecemlineatus</i>	Thirteen-lined ground squirrel
<i>Sylvilagus audubonii</i>	Desert cottontail
<i>Tamias minimus</i>	Least chipmunk
<i>Taxidea taxus</i>	American badger
<i>Thomomys talpoides</i>	Northern pocket gopher
<i>Vulpes vulpes</i>	Red fox
<i>Zapus hudsonius preblei</i>	Preble's meadow jumping mouse





# Appendix J

## *Compatibility Determination for Wildlife Observation and Wildlife Photography*

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**Uses:** Wildlife observation and wildlife photography

**Refuge Name:** Hutton Lake NWR

**County:** Albany County, Wyoming

**Establishing and Acquisition Authorities:**  
Migratory Bird Conservation Act, Executive Order 5782.

### Refuge Purposes:

- “As a refuge and breeding ground for migratory birds and other wild animals.” (Executive Order 5782, dated January 28, 1932)
- “For use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (16 U.S.C. § 715d [Migratory Bird Conservation Act])

### National Wildlife Refuge System Mission

*The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*

### Description of Uses

Provide opportunities that support wildlife-dependent recreation.

Wildlife observation and wildlife photography would be allowed year-round. This CCP will continue the above uses and add the following to improve wildlife observation and wildlife photography:

- Update and improve refuge signs.
- Develop visitor services plan.
- Establish a formal parking area with informational kiosks and brochures.
- Provide walk-in access and accessible trails with markers to designate walking trails to the best wildlife-viewing areas.

- Close roads where necessary to facilitate implementation of visitor services plan and decrease disturbance to wildlife, discourage illegal hunting, and improve maintenance.
- Update existing refuge informational brochures and wildlife list to Service standards.
- Construct accessible photography blinds where appropriate for best opportunity.
- Provide educational materials on wildlife photography techniques.
- Provide an annual educational opportunity with experienced wildlife photographers sharing their expertise.

The refuge will be open for wildlife observation and wildlife photography. Their supporting use (access) would be controlled and regulated through the publication of refuge “tear sheets” and brochures, and through information posted at the kiosks.

Wildlife observation and wildlife photography are two of the six wildlife-dependent, priority public uses specified in the Improvement Act. These uses and their supporting access-related uses can be allowed at the refuge without interfering with the migratory bird resource.

### Availability of Resources

Currently, the programs for wildlife observation and wildlife photography are administered using available resources. Implementing new programs, activities, and facilities outlined in this CCP is tied to funding requests in the form of RONS and SAMMS projects.

### Anticipated Impacts of the Uses

*Short-term impacts:* Temporary disturbance may exist to wildlife near the activity. Direct, short-term impacts may include minor damage to refuge trails when wet and muddy, minor damage to vegetation, littering, increased maintenance activity, and potential conflicts with other visitors. These activities would have only minor impacts on wildlife and would not detract from the primary purposes of the refuge.

*Long-term impacts:* None.

*Cumulative impacts:* There would be no direct or indirect cumulative impacts anticipated with these uses.

## Public Review and Comment

This compatibility determination was prepared concurrently with the draft CCP and EA for the refuge. Public review and comment was achieved concurrently with the public review and comment period for the draft CCP and EA.

## Determination

Wildlife observation and wildlife photography, along with their supporting uses, are compatible uses at Hutton Lake NWR.

## Stipulations Necessary to Ensure Compatibility

Stipulations regarding the public use program will be made available in published refuge brochures. Dates, closed areas, and other information would be specified:

- Monitor use, regulate access, and maintain necessary facilities to prevent habitat degradation and minimize wildlife disturbance.

## Justification

Based on the anticipated biological impacts above and in the EA, wildlife observation and wildlife photography at Hutton Lake NWR will not interfere with the habitat goals and objectives or purposes for which the refuge was established.

Wildlife observation and wildlife photography are priority wildlife-dependent public uses acknowledged in the Improvement Act. These uses promote an appreciation for the natural resources at the refuge. Increased public stewardship will support and complement the Service's actions in achieving the purposes of the refuge and the mission of the National Wildlife Refuge System.

## Signature



Ann Timberman  
Project Leader, Arapaho NWR  
USFWS, Region 6

3/25/08  
Date

## Review



Manuel Oliveira  
Refuge Supervisor  
USFWS, Region 6

4/11/08  
Date

## Concurrence



Richard A. Coleman, PhD  
Assistant Regional Director  
National Wildlife Refuge System  
USFWS, Region 6

4/14/08  
Date

**Mandatory 15-Year Reevaluation Date: 2022**

# Appendix K

## *Compatibility Determination for Environmental Education and Interpretation*

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**Use:** Environmental education and interpretation

**Refuge Name:** Hutton Lake NWR

**County:** Albany County, Wyoming

**Establishing and Acquisition Authorities:**

Migratory Bird Conservation Act, Executive Order 5782

### **Refuge Purposes:**

- “As a refuge and breeding ground for migratory birds and other wild animals.” (Executive Order 5782, dated January 28, 1932)
- “For use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (16 U.S.C. § 715d [Migratory Bird Conservation Act])

### **National Wildlife Refuge System Mission**

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

### **Description of Uses**

The uses will be a continuation of environmental education and interpretative programs at enhanced and expanded levels. Environmental education consists of activities conducted by refuge staff and partnerships. Interpretation occurs in less formal activities through exhibits, signs, and brochures. Visiting school and nonprofit groups would use the refuge as an outdoor classroom and tour site.

This CCP will continue with the above uses and add the following to improve environmental education and interpretation activities for visitors:

- Update and improve refuge signs.
- Update existing brochures to the Service’s graphic standards.
- In cooperation with University of Wyoming, Wyoming Audubon, and others, offer scheduled environmental education opportunities at Hutton Lake NWR.

- Create programs for students and volunteers to assist in refuge management activities.
- Provide educational opportunities to local youth organizations such as Boy Scouts and Girl Scouts.

These activities will be held during the daytime, most frequently while school is in session (September–May). Less frequently, nonprofit groups would be hosted during the summer months.

Refuge staff will provide the instruction and host classroom tours in most cases. When someone other than refuge personnel leads activities, a special use permit would be issued.

Environmental education and interpretation are two of the six wildlife-dependent, priority public uses specified in the Improvement Act. These uses can be allowed at the refuge without interfering with the migratory bird resource.

### **Availability of Resources**

Currently, environmental education and interpretation programs are conducted using available resources. Implementing new programs, activities, and facilities outlined in this CCP is tied to funding requests in the form of RONS and SAMMS projects.

### **Anticipated Impacts of the Uses**

*Short-term impacts:* Minimal disturbance to wildlife and wildlife habitat will result from these uses at the current and proposed levels. Adverse impacts are minimized through careful timing and placement of activities. Wildlife near the activities may experience temporary disturbances. Minor damage to vegetation, littering, and increased maintenance may occur. These activities will have only minor impacts on wildlife and will not detract from the primary purposes of the refuge.

*Long-term impacts:* These activities will increase local support of the refuge and increase knowledge of stewardship of natural resources to students young and old.

*Cumulative impacts:* There would be no direct or indirect cumulative impacts anticipated with the continuation of these uses.

## Public Review and Comment

This compatibility determination was prepared concurrently with the draft CCP and EA for the refuge. Public review and comment will be achieved concurrently with the public review and comment period for the draft CCP and EA.

## Determination

Environmental education and interpretation are compatible uses at Hutton Lake NWR.

## Stipulations Necessary to Ensure Compatibility

Allow environmental education and interpretation only in designated areas or under the guidance of refuge staff, partnerships, a volunteer, or a trained teacher to ensure minimal disturbance to wildlife, minimal damage to vegetation, and minimal conflicts between user groups.

Disturbance is almost an unavoidable impact of the environmental education and interpretation programs. However, it is through these activities that visitors would receive an understanding of proper etiquette and the impact people have on habitat and wildlife. This information and refuge-specific regulations will be available through visitor contacts, brochures, and kiosks. Periodic law enforcement will ensure compliance with regulations and area closures.

## Justification

Based on the anticipated biological impacts above and in the EA, it is determined that environmental education and interpretation at Hutton Lake NWR will not interfere with the habitat goals and objectives or purposes for which it was established.

Environmental education and interpretation are priority wildlife-dependent public uses acknowledged in the Improvement Act. These uses promote an appreciation for the natural resources at the refuge. Increased public stewardship will support and complement the Service's actions in achieving the purposes of the refuge and the mission of the National Wildlife Refuge System.

## Signature

Ann Timberman 3/25/08  
Ann Timberman  
Project Leader, Arapaho NWR  
USFWS, Region 6

## Review

Manuel Oliveira 4/11/08  
Manuel Oliveira  
Refuge Supervisor  
USFWS, Region 6

## Concurrence

Bud Oliveira 4/14/08  
Richard A. Coleman, PhD  
Assistant Regional Director  
National Wildlife Refuge System  
USFWS, Region 6

**Mandatory 15-Year Reevaluation Date: 2022**



# Appendix L

## Compatibility Determination for Grazing

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**Use:** Prescribed grazing

**Refuge Name:** Bamforth NWR, Hutton Lake NWR, and Mortenson Lake NWR

**County:** Albany County, Wyoming

**Establishing and Acquisition Authorities:** Migratory Bird Conservation Act, Executive Order 5782

### Refuge Purposes:

- “As a refuge and breeding ground for migratory birds and other wild animals.” (Executive Order 5782, dated January 28, 1932)
- “For use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (16 U.S.C. § 715d [Migratory Bird Conservation Act])

### National Wildlife Refuge System Mission

*The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.*

### Description of Uses

Prescribed grazing is the use of livestock, usually cattle, to remove standing vegetation, reduce vegetative litter, suppress woody vegetation or noxious weeds, open up vegetation-choked wetlands, or open up areas to sunlight and encourage native grass seedlings and growth. Prescribed grazing is carefully timed, and usually of short duration (usually 2–4 weeks), to target certain species for grazing impacts in order to benefit other species for growth after the competing vegetation has been removed.

Due to the arid climate, when it is determined refuge grasslands will benefit from prescribed grazing, this treatment will occur in the fall of the year (July–October). Grazing will be offered on a market rate or bid system to interested landowners with stipulations for eligibility. Mid-season grazing (July) removes litter and encourages some fall regrowth. Grazing later in the season (August–October) removes litter and encourages spring vegetation growth. Late-season grazing also concentrates

livestock in refuge ponds with dense vegetation when upland grass cures and becomes less palatable. This grazing can facilitate water openings within the vegetation and maintain the integrity of the pond.

Fence construction and maintenance (often a temporary electric fence) and control and rotation of the livestock are the responsibility of the cooperating private party. Market rate grazing fees are determined by the regional office, but may include standard deductions for fence construction and maintenance, frequent livestock rotations, construction of water gaps, or hauling/providing additional water in dry pasture.

The frequency and duration of prescribed grazing on the refuge will be based on site-specific evaluations of the grassland being managed.

This CCP proposes to continue with the above use and add the following to improve management of refuge upland habitats:

- Conduct upland vegetation surveys.
- Evaluate grazing program to determine appropriate stocking rates, duration, and so forth of grazing program.
- Install and maintain fencing to appropriately manage grazing program.

### Availability of Resources

Developing grazing plans and special use permits (SUPs) and monitoring compliance and biological effects require some Service resources. Most grazing management costs (fencing labor, monitoring and moving livestock, hauling water) are provided by the cooperator or permittee. Evaluating the grasslands for grazing prescriptions and grassland response is already a part of the refuge grassland management responsibilities. Some alternative form of grassland management, prescribed burning, or haying may be used if the areas are not treated with prescribed grazing. Managing grasslands through permitted haying has comparable costs to managing a prescribed grazing program. Managed mowing would be more expensive, since all labor costs would be assumed by the Service. Prescribed fire can be an effective grassland management tool, but there are personnel and weather limitations on a burning program, as well the fact that some tracts are not suited to burning management. In addition, there is an ecological benefit to rotating grassland management techniques, such as grazing, burning, and haying, at different seasons, rather than just relying on one technique.

## Anticipated Impacts of the Uses

Grazing by domestic livestock has the short-term effect of removing some or much of the standing vegetation from a tract of grassland. Properly prescribed, the effect of this removal of vegetation increases the vigor of the grassland, stimulates the growth of desired species of grass and forbs, and reduces the abundance of targeted species such as cool-season exotics, woody species, noxious weeds or invasive species, or cattails. Grazing in the spring may cause the loss of some bird nests due to trampling, and may cause some birds not to nest in areas being grazed. Grazing on public wildlife lands can create an aesthetic issue of concern for some people or visitors who do not understand grassland management. Prescribed grazing is usually of short duration and ultimately enhances the diversity and vigor of grassland habitats. Grazing livestock may create a minor and temporary disturbance to wildlife, but generally do no harm. There is a slight potential for conflict between the visiting public and the livestock or the permittee.

## Public Review and Comment

This compatibility determination was prepared concurrently with the draft CCP and EA for the refuge. Public review and comment was achieved concurrently with the public review and comment period for the draft CCP and EA.

## Determination

As this activity is an economic use, it must meet the compatibility threshold of "contributing to the Mission and Purposes" of the Refuge System and refuge area. Prescribed grazing is used to improve and manage grassland habitats on refuges and benefit the migratory birds and other wildlife that use these habitats.

The use of grazing as a habitat management tool is compatible at Hutton Lake NWR with the following stipulations.

## Stipulations Necessary to Ensure Compatibility

- SUPs will specify the stocking rates, dates of use, and timing for each unit or grazing cell on the refuge.
- The standard grazing fee or bid system, as determined for each state by the regional office, and any standard deductions for any labor or work done on Service lands will be included on the SUP.
- Grazing permittees must comply with all applicable State Livestock Health Laws.
- No supplemental feeding will be allowed

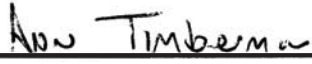
without authorization from the project leader/refuge manager.

- Control and confinement of livestock will be the responsibility of the permittee.
- The permit is issued subject to the revocation and appeals procedure contained in Title 50, Part 25 of the Code of Federal Regulations.

## Justification

Controlled grazing by domestic livestock will not materially interfere or detract from the purposes for which the refuge was established. Prescribed livestock grazing creates temporary disturbances to vegetation. Many of these disturbances are desirable for grassland management. Grazing produces an undesirable but short-term impact to grassland nesting birds and site aesthetics. In the long term, prescribed grazing increases grassland vigor, species diversity, and habitat quality. Prescribed grazing is an alternative management tool that can be used to replace or complement prescribed fire, mowing, or haying of Service grasslands. Without periodic disturbance caused by grazing the health of the grassland community would decline.


## Signature

 3/25/08  
 Ann Timberman Date  
 Project Leader, Arapaho NWR  
 USFWS, Region 6

## Review

 4/11/08  
 Manuel Oliveira Date  
 Refuge Supervisor  
 USFWS, Region 6

## Concurrence

 4/14/08  
 Richard A. Coleman, PhD Date  
 Assistant Regional Director  
 National Wildlife Refuge System  
 USFWS, Region 6

**Mandatory 15-Year Reevaluation Date: 2017**

# Appendix M

## *Section 7 Biological Evaluation*

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### INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

**Originating Persons:**

Ann Timberman, Arapaho NWR Complex  
Toni Griffin, Region 6, Division of Planning

**Telephone Numbers:**

Arapaho NWR Complex 970/723 8202  
Planning 303/236 4378

**Date:** January 10, 2008

**I. Region:** 6**II. Service Activity (Program):** Refuges**III. Pertinent Species and Habitat****A. Federally Listed Species and/or their critical habitat within the action area**

1. Black-footed Ferret (Endangered)
2. Wyoming toad (Endangered)
3. Preble's meadow jumping mouse (Threatened)
4. Ute ladies'-tresses (Threatened)

**B. Proposed species and/or proposed critical habitat within the action area**

1. None

**C. Candidate species within the action area**

1. None

**IV. Geographic area, station name, and action**

Geographic area: Laramie Plains Basin

Station(s): Bamforth NWR, Hutton Lake NWR, and Mortenson Lake NWR

Action: Issuance and implementation of Laramie Plains Comprehensive Conservation Plan

**V. Location (attach map)**

**A. Ecoregion Number and Name:** The Laramie Plains refuges are located within the USFWS Mountain-Prairie Region 6, and specifically in the Platte-Kansas Rivers ecosystem.

**B. Counties and State:** Albany County, Wyoming

**C. Section, township, and range (or latitude and longitude):**

Bamforth NWR is located at N 41° 22' 22", W 105° 44' 17", elevation 7,033 feet.

Hutton Lake NWR is located at N 41° 10' 30", W 105° 42' 54", elevation 7,207 feet.

Mortenson Lake NWR is located at N 41° 12' 27", W 105° 49' 25", elevation 7,265 feet.

**D. Distance (miles) and direction to nearest town:**

Bamforth NWR is located 6 miles northwest of Laramie, WY.

Hutton Lake NWR is located 10 miles southwest of Laramie, WY.

Mortenson Lake NWR is located 15 miles southwest of Laramie, WY.

## E. Species/habitat occurrence:

1. Black-footed ferret (*Mustela nigripes*) historically are found in association with prairie dog colonies in basin-prairie shrub lands and sagebrush-grasslands. They occupy prairie dog burrows, feed primarily on prairie dogs; also deer mice, pocket gophers, pocket mice, birds, and ground squirrels. The Black-footed ferret is classified as a federally endangered and is a protected species in Wyoming. Presently the ferret has been re-introduced in the Shirely Basin area of Wyoming. There is historical record of occurrence in Albany County before 1965 but no recent data to suggest occurrence on the Laramie Plains Refuges or in Albany County. (Cеровski et al. 2004)

2. Wyoming toad (*Bufo baxteri*) is found only in Albany County, Wyoming. The toad was first reported by George T. Baxter, a graduate student in the Department of Zoology and Physiology at the University of Wyoming, in his M.S. thesis (1946). Baxter reported that the toad was common within the floodplains and wetlands associated with fresh water ponds and irrigated pastures of Albany County from the 1950s until the early 1970s (Baxter and Stone, 1985).

In 1987, a small population confined to a two square mile area was discovered at Mortenson Lake. Intermittent surveys at Mortenson Lake and nearby habitats, by the Wyoming Game and Fish Department (McCleary 1989, Chamberlain 1990, Peterson 1991) provided evidence that this was the last remaining population of the Wyoming toad. After being discovered in 1987, the population at Mortenson Lake declined sharply. Beginning in 1995, captive bred Wyoming toads were reintroduced at Mortenson Lake to begin reestablishing the toad in Albany County, Wyoming.

Currently, the range of the toad is extremely limited. Only re-introduced populations are known to exist. These occur at Mortenson Lake National Wildlife Refuge, possibly Hutton Lake National Wildlife Refuge and several private land Safe Harbor Agreement areas. Approximately 5,600 toads (in various life stages) were released at Hutton Lake National Wildlife Refuge between 1995 and 2000. Due to drought conditions at the lake during recent years and lack of knowledge as to where the toads dispersed to, no reintroduction attempts have been made since 2000. Survey efforts were done for several years after 2000 on the Refuge, but no toads have been observed since the 2000 reintroduction. Over 35,000 Wyoming toads were released at Mortenson Lake National Wildlife Refuge between 1995 and 2003. In 2004 the Wyoming Toad Recovery Team decided not to release any more captive toads at Mortenson Lake. The thought was that the area may be a population sink and by releasing captive toads this theory could never be proved. The Wyoming toad population continues to survive at Mortenson lake, with some egg masses in some years and toads found every year to date.

3. Preble's meadow jumping mouse (*Zapus hudsonius preblei*) is a small rodent in the Zapodidae family and is 1 of 12 recognized subspecies of the species *Z. hudsonius*, the meadow jumping mouse. Preble's was listed as threatened under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) in May of 1998. The U.S. Fish and Wildlife Service finalized critical habitat for Preble's in Albany, Laramie, Platte, and Converse Counties, Wyoming south of the North Platte River and east of the Laramie Mountains in 2003 (68 FR 37276). In Wyoming, Preble's has been documented in Albany, Laramie, Platte, and Converse Counties south of the North Platte River and east of the Laramie Mountains (Beauvais 2001). Armstrong et al. (1997)



described typical Preble's habitat as "well-developed plains riparian vegetation with relatively undisturbed grassland and a water source in close proximity." Also noted was that Preble's tend to exhibit a preference for "dense herbaceous vegetation consisting of a variety of grasses, forbs, and thick shrubs." Preble's also uses hay meadows and grassy upland areas within 100 meters of the 100 year floodplain (68 FR 37276).

Previously, the Laramie Mountains were generally regarded as the western boundary of Preble's in Wyoming (Beauvais 2001). However, more recently, two specimens collected in the Laramie Basin have been identified as Preble's through skull measurements and tooth fold characteristics (Meaney 2003). Preble's has been documented to exist at Hutton NWR.

4. Ute's ladies-tresses (*Spiranthes diluvialis*) is a perennial terrestrial orchid associated with moist soils near wetland meadows, springs, lakes, and perennial streams. The elevation range of known occurrences is 4,200 to 6,800 feet in alluvial substrates along riparian edges, gravel bars, old oxbows, and moist to wet meadows (Arft and Ranker 1998). The known geographic range of Ute ladies'-tresses includes western Nebraska, southeastern Wyoming, north-central and northwestern Colorado, northern and south-central Utah, eastern Idaho, southwestern Montana, and north-central Washington (Fertig, 2005). In Wyoming, the plant occurs at four locations in Converse, Goshen, Laramie, and Niobrara counties (Fertig 2000). Hartman and Nelson surveyed the Laramie Basin from 1994 through 1999 for Ute ladies'-tresses and did not locate any new populations. In addition, Don Hazlett, a botanical consultant under contract to the BLM, surveyed private land in southeast Wyoming from 1995 through 1997 and did not discover any populations in Albany County. However, suitable habitat exists for the plant at lower elevations along streams in Albany County.

**VI. Description of proposed action:** Issuance and implementation of the Laramie Plains NWRs Comprehensive Conservation Plan.

#### **VII. Determination of effects**

A. Explanation of effects of the action on species and critical habitats in items III. A, B & C:

1. Although prairie dog towns do occur in on the Laramie Plains Refuges, there has been no documented use of the Refuges by black-footed ferrets in the recent past. The proposed sagebrush upland management changes proposed by the CCP are not expected to negatively impact prairie dog colonies so would have no effect on black-footed ferrets if they were found here.
2. Refuge use by the Wyoming Toad is not expected to change with a change in management of the wetland habitats that will occur after the CCP is completed. On Mortenson Lake NWR, Mortenson Lake and other areas will be managed to protect, create and maintain habitat suitable for Wyoming toad recovery from endangered status. Hutton Lake NWR has not had documented Wyoming toad use for seven years and wetland management changes proposed in the CCP would maintain habitat preferred by the toad.
3. Refuge use by Preble's meadow jumping mouse is not expected to change with the implementation of the CCP. Habitat management actions on Hutton Lake NWR where Preble's has been documented will maintain or increase habitat preferred by Preble's meadow jumping mouse.

4. Elevations for the Laramie Plains Refuges are above the reported elevation limit of 6,900 feet for Ute's ladies-tresses. The likelihood of this species presence is discountable and there will be no effect with the implementation of the CCP

B. Explanation of actions to be implemented to reduce adverse effects:

1. The actions of the CCP implementation on Bamforth, Hutton Lake and Mortenson Lake NWR's are not expected to create adverse effects on black-footed ferrets, Wyoming toads, Preble's meadow jumping mice and Ute's ladies-tresses. The implementation of a more defined management at Mortenson Lake may create more suitable habitat for the Wyoming toad.

**VIII. Effect determination and response requested**

A. Listed species/designated critical habitat

Determination

No effect/no adverse modification

(Black-footed ferret, Ute's ladies-tresses)

Response requested

\*Concurrence

SH

May affect, but is not likely to adversely affect species/adversely modify critical habitat (Wyoming toad, Preble's meadow jumping mouse)

\_\_\_\_ Concurrence

May affect, and is likely to adversely affect species/modify critical habitat (species: None)

\_\_\_\_ Formal Consultation

B. Proposed species/proposed critical habitat

Determination

No effect on proposed species/no adverse modification of proposed critical habitat

(species: None)

Response requested

\*Concurrence

SH

Is likely to jeopardize proposed species or adversely modify proposed critical habitat (species: None)

\_\_\_\_ Conference

C. Candidate Species

Determination

No effect

(species: None )

Response requested

\*Concurrence

SH

May affect, but is not likely to adversely affect species/adversely modify critical habitat (species: None)

\_\_\_\_ Concurrence

Is likely to jeopardize candidate species  
(species: None )

\_\_\_\_\_ Conference

Ann Timberman 1/10/08  
Ann Timberman, Project Leader Date  
Arapaho NWR Complex

IX. Reviewing ESO Evaluation

Concurrence SH Nonconcurrence \_\_\_\_\_

Formal Consultation required \_\_\_\_\_

Conference required \_\_\_\_\_

Informal conference required \_\_\_\_\_

Brian Kelly 1/31/2008  
Brian Kelly, Field Supervisor Date  
Ecological Services, Cheyenne, WY





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